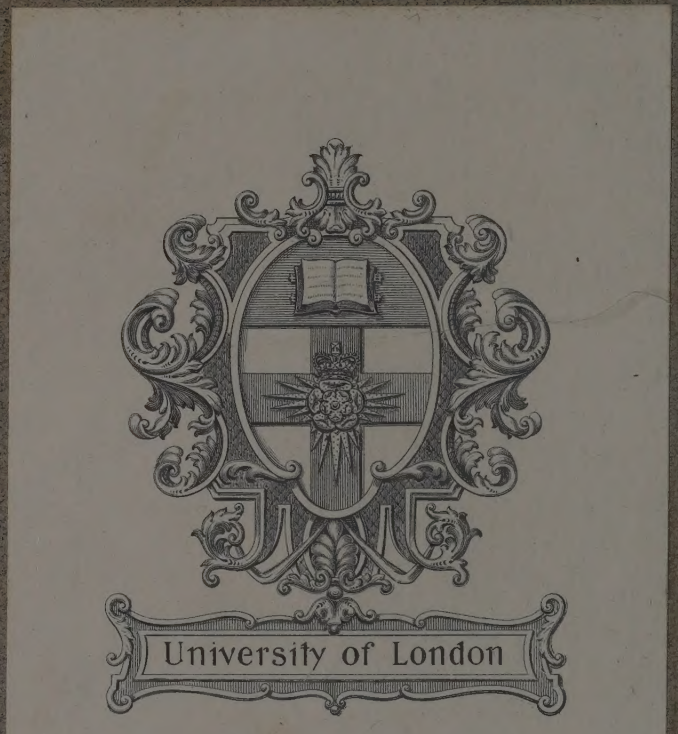
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Reports from Commissioners 1878-79 Miscellaneous folio portions

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[c.2321] Reports of the Inspectors of Mines for the year 1878.
102. Report of the commissioners sent by the Government to watch the Abercarne Inquest, and evidence given before the Coroner.
350. Special report on the Blantyre Colliery, by Messrs. Joseph Dickinson and Ralph Moore, Inspectors of Mines.
[c.2370] Report of Mr Wheelhouse, Q.C., on the inquest held in the case of the Dinas Colliery explosion, with notes of evidence.

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[c.2337] Report by the Inspectors of Fisheries on the provisions of a Bill for the amendment of the...Salmon Fishery Act, 1873.
[c.2333] Report of the Inspectors of Irish Fisheries on the sea and inland fisheries of Ireland, for 1878. [With appendix.]
351. Report of the Inspectors of Irish Fisheries, 1877, on the subject of branding herrings in Ireland and Scotland...
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FROM

COMMISSIONERS, INSPECTORS,

AND OTHERS:

TWENTY-SEVEN VOLUMES.

—*(4.)*—

MINES.

Session

5 *December* 1878 —— 15 *August* 1879.

VOL. XVIII.

1878-9.

REPORTS

FROM

COMMISSIONERS, INSPECTORS,

AND OTHERS

RELATIVE TO

—(v)—

Session

1870

VOL. XVIII

1870

REPORTS

FROM

COMMISSIONERS, INSPECTORS,

AND OTHERS:

1878-9.

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FOURTH VOLUME.

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MINES.

REPORTS

OF

THE INSPECTORS OF MINES,

TO

HER MAJESTY'S SECRETARY OF STATE,

For the Year 1878.

Mr. DICKINSON, Manchester District.
Mr. WYNNE, North Staffordshire District.
Mr. ALEXANDER, Scotland, West.
Mr. T. EVANS, Midland District.
Mr. BAKER, South Staffordshire District.
Mr. MOORE, Scotland, East.
Mr. WALES, South Wales.
Mr. WARDELL, Yorkshire District.
Mr. WILLIS, Newcastle-on-Tyne District.
Mr. BELL, Durham District.
Mr. HALL, Liverpool District.
Mr. CADMAN, South-western District.
Mr. T. F. EVANS, Anglesey, Brecon, Cardigan, etc.
Dr. C. LE NEVE FOSTER, Cornwall, Devonshire, and part of Somersetshire.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
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FOR HER MAJESTY'S STATIONERY OFFICE.

1879.

[C.—2321.] *Price* 12*s.* 6*d.*

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A List of the Names, Addresses, and Districts assigned, of Her Majesty's Inspectors of Mines according to Seniority of Appointment; and also the Names and Addresses of the Inspectors Assisting. 31st March 1879.

Names and Addresses of Chief Inspectors.	Names and Addresses of Inspectors Assisting.	Districts Assigned.	
		Under Coal Mines Act.	Under Metalliferous Mines Acts.
Joseph Dickinson, Esq., Pendleton, Manchester.	J. S. Martin, Esq., Prestwich, Manchester.	Manchester District, comprising North and East Lancashire and Ireland.	Within the Coalfield of North and East Lancashire, in Cheshire, Sussex, and Ireland.
Thomas Wynne, Esq., Gnosall, Stafford.	S. B. Gilroy, Esq., Stone, Stafford.	North Staffordshire District, comprising North Staffordshire, Cheshire, and Shropshire.	North Staffordshire and part of Shropshire.
William Alexander, Esq., Glasgow.	J. M. Ronaldson, Esq., Pollokshields, Glasgow.	Scotland, West District, comprising counties of Argyle, Ayr, Dumfries, Dumbarton, Renfrew, and portions of Lanark and Stirling.	Argyle, Ayr, Dumfries, Dumbarton, Kircudbright, Renfrew, Wigtown, and portions of Lanark and Stirling.
Thomas Evans, Esq., Pen-y-bryn, Derby.	A. H. Stokes, Esq., Derby.	Midland District, comprising counties of Derby, Leicester, Nottingham, and Warwick.	Part of Derby, Leicester, Northampton, Nottingham, Oxford, and Warwickshire.
James P. Baker, Esq., Tettenhall, Wolverhampton.	W. B. Scott, Esq., Compton Road, Wolverhampton.	South Staffordshire District, comprising South Staffordshire and Worcestershire.	South Staffordshire and Worcestershire.
Ralph Moore, Esq., Rutherglen, Glasgow.	J. T. Robson, Esq., Cambuslang, Glasgow.	Scotland, East District, comprising counties of Clackmannan, Perth, Kinross, Sutherland, Edinboro', Fife, Haddington, Linlithgow, upper and middle wards of Lanark, and part of Stirling.	Clackmannan, Edinbro', Fife, Haddington, Kinross, Linlithgow, Perth, Sutherland, and portions of Lanark, Stirling, Shetland, and Inverness.
Thos. E. Wales, Esq., Swansea.	W. Galloway, Esq., Cardiff.	South Wales District, comprising counties of Carmarthen, Glamorgan, Pembroke, and part of Brecon.	Carmarthen, Glamorgan, and Pembroke.
Frank N. Wardell, Esq., Wath-upon-Dearne, Rotherham.	John Gerrard, Esq., Wakefield.	Yorkshire and Lincolnshire District, comprising Yorkshire, exclusive of North Riding, and Lincolnshire.	Yorkshire, exclusive of North Riding.
James Willis, Esq., Newcastle-on-Tyne.	J. B. Atkinson, Esq., Ridley Mill, Stocksfield, Newcastle-on-Tyne.	Newcastle District, comprising counties of Cumberland, Northumberland, and part of Durham.	——
T. F. Evans, Esq., Amlwch, Anglesey.	- - - -	- - - -	Anglesey, Brecon, Cardigan, Carnarvon, Cumberland, Denbigh, part of Derby, Flint, Lancaster, Merioneth, Montgomery, Radnor, Shropshire, and the Isle of Man.
C. Le Neve Foster, Esq., Truro.	- - - -	- - - -	Cornwall, Devon, Dorset, and part of Somersetshire.
Thomas Bell, Esq., Durham.	W. N. Atkinson, Esq., Chilton Moor, Fence Houses.	Durham District, comprising county of Westmoreland, part of Durham, and North Riding of Yorkshire.	Durham, Westmorland, and North Riding of Yorkshire.
Henry Hall, Esq. Rainhill, Prescot.	J. L. Hedley, Esq., Fairfield, Liverpool.	Liverpool District, comprising counties of Anglesey, Denbigh, Flint, and part of Lancashire.	
Thomas Cadman, Esq., Newport, Monmouthsh.	R. Donald Bain, Esq., Newport, Monmouthshire.	South-western District, comprising the counties of Gloucester, Monmouth, Somerset, and portions of Brecon and Glamorgan.	Eastern part of Glamorganshire, Gloucester, Hereford, Monmouth, Somerset, and Wiltshire.

MINES CLASSED UNDER THE COAL MINES REGULATION ACT.

Summaries of the Statistics for the Twelve Districts under the Coal Mines Regulation Act, for the Year 1878.

MINES CLASSED UNDER THE METALLIFEROUS MINES REGULATION ACT.

Summaries of the Persons employed, Mining Produce, Separate Fatal Accidents, and Lives lost by the Accidents, for the Year 1878.

Year 1878.

Summaries of the Statistical portions of the Reports of Her Majesty's Inspectors of Mines.

The Reports are each made separately to the Right Honourable R. A. Cross, M.P., Her Majesty's Principal Secretary of State for the Home Department. The statistics are collated by the Inspectors from Returns supplied from the Mines to each Inspector.

Coal Mines Regulation Act.

The Summaries of the statistics for the twelve districts consist of four separate documents in tabular form, showing the aggregate number of persons employed during the year above and below ground in the coal, fire-clay, ironstone, and shale mines of Great Britain and Ireland.

The 1st summary shows the number and ages of the male persons employed both above and below ground, and also the number and ages of the females employed above ground, together with the quantity of mineral raised in each of the twelve Inspection Districts. It appears that in the aggregate 475,329 persons were employed in and about the mines already mentioned herein. Of these 382,979 were employed underground, and 92,350 (of whom 4,956 were females) employed above ground; thus showing, as compared with the respective numbers employed during the year 1877, a decrease of 19,062, namely, 18,640 males and 422 females.

2nd. This summary gives the mining produce either in districts or counties, by which it appears that 132,612,063 tons of coal, 1,625,586 tons of fire-clay, 19,747,227 tons of ironstone, and 813,262 tons of shale, &c. were produced in the mines classed under the Coal Mines Regulation Act, including the quantity of iron pyrites, &c. found in working these mines, which is separately given in the respective districts to which the latter remarks apply. Comparing the above quantities with the output of 1877, a decrease is shown in coal of 1,567,905 tons; fire-clay, a decrease of 187,955 tons; ironstone a decrease of 1,267,129 tons, and a decrease of 25,133 tons in the quantity of shale, &c.

Summary No. 3 contains an account of fatal accidents and lives lost during the year 1878 in and about all the mines coming within the scope of the Coal Mines Regulation Act. The fatal accidents amounted to 811, and the deaths occasioned thereby reached 1,413, showing a decrease, when compared with the summary of 1877, of 53 in the number of fatal accidents, and an increase of 205 in the number of lives lost.

No. 4, the last of the summaries classed under this Act, shows the proportion which the accidents and deaths bear to the number of persons employed and the quantity of mineral raised. It appears that on the average during the year under review there was one fatal accident amongst every 586 persons employed in and about the mines, and one death by accident amongst every 336 persons employed; and that for each fatal accident 179,777 tons of mineral were got, and 103,177 tons for each death by accident. During the year 1877, of every 572 persons employed there was one fatal accident, and for every death by accident 409 persons were employed. For the year 1878, one accident has to be recorded for every 586 persons employed, and one death for every 336 persons employed. In 1877 the smaller quantity of 172,276 tons of mineral were wrought per accident, and the larger quantity of 123,217 tons per death.

In giving a synopsis of the summaries, and after making comparison with those of the preceding year, it should be stated that, whilst the Returns show a diminution in the number of persons employed, there was also a decrease of 263 mines at work, and that the quantity of mineral raised is smaller than that of 1877 by 3,057,122 tons.

No. 1.—Summary of Persons Employed in and about the Mines under the Coal Mines Act, and Tons of Mining Produce, in Great Britain and Ireland, in the Year 1878.

Names of Districts and Inspectors.	Underground.					Aboveground—Ages.							Total above and below ground.	Coal.	Fire-clay	Ironstone.	Shale, &c.
	Male Persons—Ages.					10 to 13.		13 to 16.		Above 16.							
	10 to 12.	12 to 13.	13 to 16.	Above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.	Total.					
														Tons.	Tons.	Tons.	Tons.
Newcastle: James Willis.																	
Cumberland	–	18	353	3,882	4,253	1	–	61	7	329	1,127	1,525	5,778	1,393,514	34,771	–	*a* 531
Durham, North	–	221	1,473	12,550	14,244	72	–	486	–	–	3,234	3,792	18,036	6,265,410	121,430	–	–
Northumberland	–	228	1,743	15,832	17,803	28	–	363	–	–	3,386	3,777	21,580	5,254,927	97,491	–	*b* 3,607
Durham: Thomas Bell.																	
Durham, South	–	782	4,220	37,778	42,780	204	–	1,119	1	8	8,777	10,109	52,889	18,612,246	227,046	–	–
Westmoreland	–	–	–	15	15	–	–	–	–	–	2	2	17	1,830	–	–	–
Yorkshire, North Riding	–	16	283	5,355	5,654	12	–	89	–	–	1,036	1,137	6,791	6,836	4,350	5,316,477	–
Manchester: Jos. Dickinson.																	
Lancashire, North and East	171	515	2,444	21,596	24,726	141	1	281	12	215	4,413	5,063	29,789	8,633,839	76,840	41	*c* 5,699
Ireland	–	–	29	812	841	–	–	8	–	1	372	381	1,222	122,051	3,808	–	–
Liverpool: Henry Hall.																	
Anglesey	–	–	–	7	7	–	–	–	–	–	6	6	13	672	–	–	–
Denbighshire	–	17	471	4,537	5,025	–	1	71	14	58	1,088	1,232	6,257	1,514,829	31,298	17,890	–
Flintshire	–	–	127	2,481	2,608	1	–	83	–	–	682	766	3,374	708,724	10,096	210	9,741
Lancashire, West	–	329	2,073	20,775	23,177	33	–	387	129	1,193	4,461	6,203	29,380	9,427,572	47,060	1,474	–
Yorkshire: F. N. Wardell.																	
Yorkshire, East & West Ridings	302	925	5,719	41,039	47,985	167	5	804	3	11	10,802	11,792	59,777	15,582,283	174,865	226,793	11,224
Lincolnshire (ironstone)	–	–	2	79	81	1	–	2	–	–	90	93	174	–	–	193,014	–
Midland: Thomas Evans.																	
Derbyshire	–	165	2,348	18,677	21,190	12	–	598	–	–	5,175	5,785	26,975	7,289,380	9,286	38,776	*d* 1,463
Leicestershire	–	27	307	2,854	3,188	8	–	84	–	–	997	1,089	4,277	1,021,497	33,142	35	–
Nottinghamshire	–	29	261	2,869	3,159	3	–	68	–	–	961	1,032	4,191	1,022,915	13,080	28,628	*f* 3,138
Warwickshire	–	44	1,072	9,517	10,633	13	–	209	–	–	3,056	3,278	13,911	4,106,392	–	7,487	*e* 101
Staffordshire, N.: Thos. Wynne.																	
Cheshire	–	26	158	1,691	1,875	14	–	47	–	–	523	584	2,459	617,000	5,500	–	87,000
Shropshire	1	26	401	3,338	3,756	1	–	54	94	586	733	1,468	5,234	827,200	30,100	335,300	–
Staffordshire, North	–	113	1,120	11,830	13,063	8	–	258	–	1	3,578	3,845	16,908	4,140,200	11,300	1,756,450	34,800

a Gannister. *b* Limestone. *c* Includes 556 Cop. Lumps. *d* Includes 958 Pyrites, 480 Gannister, 25 Petrolium. *e* Pyrites. *f* Includes 1,548 Pyrites and 1,590 Alum Shale.

Summary of Persons Employed in and about the Mines, &c.—*continued.*

Names of Districts and Inspectors.	Underground. Male Persons—Ages. 10 to 12.	12 to 13.	13 to 16.	Above 16.	Total.	Aboveground—Ages. 10 to 13. Males.	Females.	13 to 16. Males.	Females.	Above 16. Females.	Males.	Total.	Total above and below ground.	Coal.	Fire-clay.	Ironstone.	Shale.
														Tons.	Tons.	Tons.	Tons.
Staffordshire, S.: J. P. Baker.																	
Worcestershire and South Staffordshire	–	58	1,388	17,235	18,681	3	–	478	8	514	5,419	6,422	25,103	8,976,000	176,001	191,513	*a* 1,425
South-western: Thomas Cadman.																	
Breconshire (part of)	–	–	20	253	273	–	–	2	2	13	30	47	320	89,141	–	–	–
Glamorganshire (part of)	–	53	246	1,744	2,043	–	2	5	6	40	269	322	2,365	739,480	2,429	349	–
Gloucestershire, Forest of Dean	–	16	385	2,890	3,291	2	–	44	–	–	648	694	3,985	657,275	959	–	–
Do. Bristol District	–	–	130	2,175	2,305	–	–	47	–	–	543	590	2,895	482,129	1,438	450	–
Monmouthshire	–	461	1,730	12,559	14,750	2	–	113	45	365	1,842	2,367	17,117	4,491,291	64,916	99,793	*b* 7,842
Somersetshire	–	60	367	2,921	3,348	–	–	61	–	–	783	844	4,192	692,942	711	3	–
Wales, South: Thos. E. Wales.																	
Breconshire (part of)	–	5	9	108	122	–	–	2	–	5	9	16	138	31,383	–	3,306	–
Carmarthen	–	12	227	1,678	1,917	–	–	36	–	–	473	509	2,426	624,120	8,572	1,938	–
Glamorganshire (part of)	–	1,162	3,638	30,049	34,849	12	10	344	25	437	5,411	6,239	41,088	11,405,282	55,327	90,945	–
Pembroke	–	–	37	155	192	–	–	2	–	34	54	90	282	36,421	–	–	–
Scotland, East: Ralph Moore.																	
Coal	–	259	3,218	25,139	28,616	5	–	365	71	561	4,800	5,802	34,418	11,667,559	–	–	–
Fire-clay	–	–	7	339	346	–	–	1	–	–	75	76	422	–	184,459	–	–
Ironstone	–	32	312	2,779	3,123	5	2	28	4	43	620	702	3,825	–	–	713,277	–
Shale	–	11	134	1,082	1,227	–	–	13	–	–	193	206	1,433	–	–	–	535,626
Scotland, West: W. Alexander.																	
Coal	–	151	1,470	12,913	14,534	3	–	180	6	30	2,694	2,913	17,447	6,169,723		–	–
Ironstone	–	37	637	6,505	7,179	1	–	80	6	58	1,385	1,530	8,709	–	–	1,723,078	–
Fire-clay, Shale, &c.	–	–	–	110	110	–	–	–	–	–	22	22	132	–	199,311	–	*c* 111,065
Totals, Great Britain and Ireland	474	5,798	38,559	338,148	382,979	752	21	6,873	433	4,502	79,769	92,350	475,329	132,612,063	1,625,586	10,747,227	813,262

a Includes 1,275 Cop. Lumps, 150 Cement Stone. *b* Building stone. *c* Includes 752 Pyrites.

No. 2.—Summary of Mining Produce, under the Coal Mines Regulation Act, in Great Britain and Ireland in the Year 1878.

COAL.

	Inspector.	Tons.	Total Tons.
ENGLAND and WALES:			
Anglesey	H. Hall	—	672
Breconshire (part of)	T. Cadman	89,141	—
Do.	T. E. Wales	31,383	—
			120,524
Carmarthen	T. E. Wales	—	624,120
Cheshire	T. Wynne	—	617,000
Cumberland	J. Willis	—	1,393,514
Denbighshire	H. Hall	—	1,514,829
Derbyshire	T. Evans	—	7,289,380
Durham, North	J. Willis	6,265,410	—
Do. South	T. Bell	18,612,246	—
			24,877,656
Flintshire	H. Hall	—	708,724
Glamorganshire (part of)	T. Cadman	739,480	—
Do.	T. E. Wales	11,405,282	—
			12,144,762
Gloucestershire, Bristol	T. Cadman	482,129	—
Do. Forest of Dean	Do.	657,275	—
			1,139,404
Lancashire, North and East	J. Dickinson	8,633,839	—
Do. West	H. Hall	9,427,572	—
			18,061,411
Leicestershire	T. Evans	—	1,021,497
Monmouthshire	T. Cadman	—	4,491,291
Northumberland	J. Willis	—	5,254,927
Nottinghamshire	T. Evans	—	4,106,392
Pembrokeshire	T. E. Wales	—	36,421
Shropshire	T. Wynne	—	827,200
Somersetshire	T. Cadman	—	692,942
Staffordshire, North	T. Wynne	4,140,200	—
Do. South	J. P. Baker	8,976,000	—
Worcestershire	Do.		
			13,116,200
Warwickshire	T. Evans	—	1,022,915
Westmoreland	T. Bell	—	1,830
Yorkshire, East and West	F. N. Wardell	15,582,283	—
Do. North Riding	T. Bell	6,836	—
			15,589,119
			114,652,730
SCOTLAND:			
Argyle and Dumfries	W. Alexander	—	105,596
Ayrshire	Do.	—	3,184,429
Clackmannan, Kinross, Perth, and Sutherland.	R. Moore	—	273,213
Dumfries (see Argyle)	W. Alexander.	—	—
Dumbarton	Do.	—	210,520
Edinburgh	R. Moore	—	725,122
Fife	Do.	—	1,676,901
Haddington	Do.	—	221,639
Kinross (see Clackmannan)	Do.	—	—
Lanark, East	Do.	7,683,595	—
Do. West	W. Alexander	2,253,660	—
			9,937,255
Linlithgow	R. Moore	—	394,721
Perth (see Clackmannan)	Do.	—	—
Renfrew	W. Alexander	—	163,450
Stirling, West	Do.	252,068	—
Do. East	R. Moore	692,368	—
			944,436
Sutherland (see Clackmannan)	Do.	—	—
			17,837,282
IRELAND:			
Connaught	J. Dickinson	—	6,456
Leinster	Do.	—	74,474
Munster	Do.	—	28,714
Ulster	Do.	—	12,407
			122,051
Total produce of Coal in Great Britain and Ireland			132,612,063

Summary of Mining Produce—*continued.*

FIRE-CLAY.

	Inspector.	Tons.	Total Tons.
ENGLAND AND WALES:			
Carmarthen	T. E. Wales		8,572
Cheshire	T. Wynne		5,500
Cumberland	J. Willis		34,771
Denbighshire	H. Hall		31,298
Derbyshire	T. Evans		9,286
Durham, North	J. Willis	121,430	—
Do. South	T. Bell	227,046	—
			348,476
Flintshire	H. Hall		10,096
Glamorganshire (part of)	T. Cadman	2,429	—
Do.	T. E. Wales	55,327	—
			57,756
Gloucestershire, Forest of Dean	T. Cadman	959	—
Do. Bristol	Do.	1,438	—
			2,397
Lancashire, North and East	J. Dickinson	76,840	—
Do. West	H. Hall	47,060	—
			123,900
Leicestershire	T. Evans		33,142
Monmouthshire	T. Cadman		64,916
Northumberland	J. Willis		97,491
Shropshire	T. Wynne		30,100
Somersetshire	T. Cadman		711
Staffordshire, North	T. Wynne	11,300	—
Do. South, and Worcestershire.	J. P. Baker	176,001	—
			187,301
Warwickshire	T. Evans		13,080
Yorkshire, East and West	F. N. Wardell		174,865
„ North Riding	T. Bell		4,350
			1,238,008
SCOTLAND:			
Ayrshire	W. Alexander		84,957
Clackmannan, Perth	R. Moore		7,735
Dumbarton	W. Alexander		3,000
Dumfries	Do.		3,120
Edinburgh	R. Moore		44,659
Fife	Do.		7,760
Haddington	Do.		16,718
Lanark, East	Do.	93,211	—
Do. West	W. Alexander	82,690	—
			175,901
Linlithgow	R. Moore		9,269
Perth (see Clackmannan)	Do.	—	—
Renfrew	W. Alexander		25,544
Stirling, East	R. Moore		5,107
			383,770
IRELAND:			
Ulster	J. Dickinson		3,808
			3,808
Total produce of Fireclay in Great Britain and Ireland			1,625,586

Summary of Mining Produce—*continued.*

IRONSTONE.

	Inspector.	Tons.	Total Tons.
ENGLAND AND WALES:			
Breconshire (part of)	T. Cadman		3,306
Do.	T. E. Wales		
Do.	Do.		1,938
Carmarthen	H. Hall		17,890
Denbighshire	T. Evans		38,776
Derbyshire	H. Hall		210
Flintshire	T. Cadman	349	—
Glamorganshire (part of)	T. E. Wales	90,945	—
Do.			91,294
Gloucester, Bristol District	T. Cadman		450
Lancashire, North and East	J. Dickinson		41
Do. West	H. Hall		1,474
Leicestershire	T. Evans		35
Lincolnshire (exclusive of open work)	F. N. Wardell		193,014
Monmouthshire	T. Cadman		99,793
Nottinghamshire	T. Evans		7,487
Shropshire	T. Wynne		335,300
Somersetshire	T. Cadman		3
Staffordshire, North	T. Wynne	1,756,450	—
Do. South, and Worcestershire.	J. P. Baker	191,513	—
			1,947,963
Warwickshire	T. Evans		28,628
Yorkshire, East and West	F. N. Wardell	226,793	—
Do. Cleveland	T. Bell	5,316,477	—
			5,543,270
			8,310,872
SCOTLAND:			
Ayrshire	W. Alexander		930,121
Dumbarton	Do.		257,515
Edinburgh	R. Moore		57,565
Fife	Do.		19,463
Haddington	Do.		2,101
Kinross and Perth	Do.		21,559
Lanark (part of)	Do.	425,131	—
Do. (part of)	W. Alexander	210,141	—
			635,272
Linlithgow	R. Moore		170,126
Perth (see Kinross)	Do.	—	—
Renfrew	W. Alexander		173,529
Stirling (part of)	R. Moore	17,332	—
Do. do.	W. Alexander	151,772	—
			169,104
			2,436,355
IRELAND			None.
Total produce of Ironstone in Great Britain			10,747,227

LIMESTONE.

ENGLAND AND WALES:			
Northumberland	James Willis		3,607

PETROLEUM.

ENGLAND AND WALES:			
Derbyshire	T. Evans		25

Summary of Mining Produce—*continued.*

PYRITES OR COPPERAS LUMPS.

	Inspector.	Tons.	Total Tons.
ENGLAND:			
Lancashire, North and East	J. Dickinson		556
Staffordshire, South, and Worcestershire.	J. P. Baker		1,275
Derbyshire	T. Evans		3,087*a*
Cumberland	J. Willis		531*b*
			4,449
SCOTLAND:			
Dumbarton	W. Alexander		410
Renfrew	Do.		342
			752
		Total	5,201

a, includes 2,607 Pyrites and 480 Ganister. *b*, Ganister.

SHALE.

ENGLAND AND WALES:			
Cheshire (mixed with cannel)	T. Wynne		87,000
Flintshire	H. Hall		9,741
Staffordshire, North (mixed with cannel).	T. Wynne		34,800
Yorkshire	F. N. Wardell		11,224
			142,765
SCOTLAND:			
Ayrshire	W. Alexander		17,009
Edinburgh	R. Moore		313,157
Lanark (part of)	Do.	32,148	—
Do. (part of)	W. Alexander	1,090	—
			33,238
Linlithgow	R. Moore		189,271
Renfrew	W. Alexander		92,214
Stirling (part of)	R. Moore		1,050
			645,939

SHALE (ALUM).

ENGLAND:			
Lancashire, North and East	J. Dickinson		5,143
Warwickshire	T. Evans		1,590
			6,733
SCOTLAND	None.		
IRELAND	None.		

STONE (BUILDING, CEMENT, AND GANISTER).

ENGLAND AND WALES:			
Monmouth	T. Cadman		7,842
South Stafford and Worcestershire	J. P. Baker		150
			7,992
	Total produce of Shale, &c.		813,262

No. 3.—SUMMARY of Separate FATAL ACCIDENTS in and about the COAL, IRONSTONE, FIRE-CLAY, and SHALE MINES of GREAT BRITAIN and IRELAND during the Year 1878.

NAMES OF DISTRICTS.	Explosions of Fire-damp.	Falls in Mine.			In Shafts.									Miscellaneous Underground.									On Surface.				Gross Total.
		Falls of Sides.	Falls of Roof.	Total Falls of Ground in Mine.	Overwinding.	Ropes and Chains breaking.	Whilst ascending or descending by Machinery.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total { Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and North Durham	1	4	27	31	–	1	–	1	–	–	–	1	3	1	–	–	–	1	6	–	–	8	–	–	6	6	49
South Durham and Westmoreland	3	2	34	36	–	–	–	1	–	–	1	5	7	–	–	1	–	7	7	2	5	22	1	–	9	10	78
Yorkshire, N. Riding	–	4	3	7	–	–	–	–	–	–	–	–	–	1	–	–	–	3	2	–	3	9	–	–	1	1	17
North and East Lancashire	3	9	23	32	–	–	1	1	–	–	1	1	4	–	1	1	–	2	1	–	1	6	4	–	5	9	54
Ireland	–	–	2	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
West Lancashire and North Wales	5	11	41	52	–	1	1	2	–	4	–	–	8	2	1	–	1	4	9	1	4	22	2	1	12	15	102
Yorkshire	4	7	31	38	1	–	–	1	1	–	–	1	4	1	2	–	–	8	7	–	2	20	1	–	9	10	76
Do. (ironstone)	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Derbyshire, Nottinghamshire, Leicestershire, and Warwickshire	–	10	19	29	–	1	1	1	–	–	2	2	7	1	–	–	–	2	5	–	–	8	2	–	3	5	49
N. Staffordshire, Cheshire, and Shropshire	3	5	16	21	2	–	6	1	–	–	–	–	9	–	–	–	–	3	–	–	–	3	–	–	–	–	36
Do. (ironstone)	–	–	10	10	–	–	2	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	12
South Staffordshire and Worcestershire	1	9	21	30	–	–	3	1	–	1	–	2	7	2	–	–	–	–	3	–	–	5	–	–	1	1	44
Do. (ironstone and fire-clay)	–	1	–	1	–	–	–	1	–	1	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Monmouthshire, Gloucestershire, Somersetshire, and Devonshire	1	13	31	44	–	–	–	1	–	–	–	3	4	1	–	–	–	3	5	–	4	13	–	–	3	3	65
Do. (ironstone)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
South Wales	5	21	39	60	2	–	5	1	1	–	8	1	18	–	1	1	–	6	6	–	2	16	–	1	11	12	111
Do. (ironstone)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Eastern District of Scotland	1	9	23	32	1	–	1	1	1	1	3	4	12	–	1	–	–	1	1	–	4	6	1	–	6	7	58
Do. (ironstone, &c.)	–	2	1	3	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	5
Western District of Scotland	4	9	16	25	–	–	2	–	–	1	1	1	5	2	–	1	–	2	1	–	–	6	2	–	2	4	44
Do. (ironstone, &c.)	–	–	2	2	–	–	–	–	–	1	–	–	1	–	–	–	–	–	1	–	–	1	–	–	1	1	5
Total Separate Accidents in 1878	31	116	340	456	6	3	22	13	3	9	17	21	94	11	6	4	1	42	54	3	25	146	13	2	69	84	811
Ditto ditto 1877	45	132	300	432	2	2	20	15	5	31	17	25	117	14	7	2	–	43	78	9	19	172	17	5	76	98	864

Decrease - 53

No. 3.—Summary of Deaths caused by the aforesaid Accidents in and about the Coal, Ironstone, Fire-clay, and Shale Mines of Great Britain and Ireland during the Year 1878.

Names of Districts.	Explosions of Fire-damp.	Falls in Mine.			In Shafts.								Miscellaneous Underground.									On Surface.				Gross Total.
		Falls of Sides.	Falls of Roof.	Total Falls of Ground in Mine.	Overwinding.	Ropes and Chains breaking.	Whilst ascending or descending by Machinery.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total {Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and North Durham	1	4	28	32	–	2	–	1	–	–	–	1	4	1	–	–	–	1	6	–	–	8	–	–	6	6	51
South Durham and Westmoreland	4	2	35	37	–	–	–	1	–	–	1	5	7	–	–	1	–	7	7	2	8	25	1	–	9	10	83
Yorkshire, N. Riding	–	4	3	7	–	–	–	–	–	–	–	–	–	1	–	–	–	3	2	–	3	9	–	–	1	1	17
North and East Lancashire	45	9	24	33	–	–	1	1	–	–	1	1	4	–	1	2	–	2	1	–	2	8	4	–	5	9	99
Ireland	–	–	2	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
West Lancashire and North Wales	204	11	43	54	–	1	2	2	–	4	–	–	9	2	1	–	1	4	9	1	4	22	2	1	12	15	304
Yorkshire	4	7	32	39	2	–	–	1	1	–	–	1	5	1	4	–	–	8	7	–	2	22	1	–	9	10	80
Do. (ironstone)	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Derbyshire, Nottinghamshire, Leicestershire, and Warwickshire	–	11	20	31	–	1	1	1	–	–	6	2	11	1	–	–	–	2	5	–	–	8	2	–	3	5	55
N. Staffordshire, Cheshire, and Shropshire	28	5	16	21	3	–	6	1	–	–	–	–	10	–	–	–	–	3	–	–	–	3	–	–	–	–	62
Do. (ironstone)	–	–	10	10	–	–	3	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	13
South Staffordshire and Worcestershire	1	9	22	31	–	–	3	1	–	1	–	2	7	4	–	–	–	–	3	–	–	7	–	–	1	1	47
Do. (ironstone and fire-clay)	–	1	–	1	–	–	–	1	–	1	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Monmouthshire, Gloucestershire, Somersetshire, and Devonshire	268	14	31	45	–	–	–	1	–	–	–	3	4	1	–	–	–	3	5	–	4	13	–	–	3	3	333
Do. (ironstone)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
South Wales	7	21	41	62	3	–	7	1	1	–	8	1	21	–	1	4	–	6	6	–	2	19	–	3	11	14	123
Do. (ironstone)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Eastern District of Scotland	2	9	24	33	6	–	1	1	1	1	3	4	17	–	–	–	–	1	1	–	4	6	1	–	6	7	65
Do. (ironstone, &c.)	–	2	1	3	–	–	–	–	–	–	1	–	1	–	2	–	–	–	–	–	–	2	–	–	–	–	6
Western District of Scotland	22	9	16	25	–	–	2	–	–	1	1	1	5	2	–	3	–	2	1	–	–	8	2	–	2	4	64
Do. (ironstone, &c.)	–	–	2	2	–	–	–	–	–	1	–	–	1	–	–	–	–	–	1	–	–	1	–	–	1	1	5
Total Lives lost in 1878	586	118	351	469	14	4	26	13	3	9	21	21	111	13	9	10	1	42	54	3	29	161	13	4	69	86	1413
Ditto ditto 1877	345	135	313	448	4	4	21	15	5	31	20	29	129	14	15	9	–	43	78	9	19	187	17	6	76	99	1208

Increase - 205

No. 4.—SUMMARY showing the PROPORTION of ACCIDENTS and LIVES LOST to the NUMBER of PERSONS EMPLOYED in and about the MINES, under the COAL MINES ACT, and the QUANTITY of MINERALS WROUGHT in GREAT BRITAIN and IRELAND during the Year 1878.

NAMES OF DISTRICTS.	Persons Employed in and about the Mines.	TONS OF MINERAL WROUGHT.					Separate Fatal Accidents.	Lives Lost by the Accidents.	Persons Employed		Tons of Mineral Wrought		Number of Mines.
		Coal.	Fireclay.	Ironstone.	Oil Shale, &c.	Total.			Per Fatal Accident.	Per Life Lost.	Per Fatal Accident.	Per Life Lost.	
Northumberland, Cumberland, and North Durham	45,394	12,913,851	253,692	—	4,138	13,171,681	49	51	926	890	268,810	258,268	207
South Durham, Westmoreland, and North Riding of Yorkshire	52,906	18,614,076	227,046	—	—	18,841,122	78	83	680	638	241,553	227,002	219
Yorkshire—Cleveland (ironstone)	6,791	6,836	4,350	5,316,477	—	5,327,663	17	17	399	399	313,392	313,392	44
North and East Lancashire	29,789	8,633,839	76,840	41	5,699	8,716,419	54	99	552	301	161,415	88,044	314
Ireland	1,222	122,051	3,808	—	—	125,859	2	2	611	611	62,930	62,930	31
West Lancashire and North Wales	39,024	11,651,797	88,454	19,574	9,741	11,769,566	102	304	382	128	115,388	38,716	263
Yorkshire	59,777	15,582,283	174,865	226,793	11,224	15,995,165	77	81	776	738	207,729	197,471	515
Lincolnshire (ironstone)	174	—	—	193,014	—	193,014	—	—	—	—	—	—	10
Derbyshire, Leicestershire, Nottinghamshire, and Warwickshire	49,354	13,440,184	55,508	74,926	4,702	13,575,320	49	55	1,007	897	277,047	246,824	390
North Stafford, Cheshire, and Shropshire	24,601	5,584,400	46,900	2,091,750	121,800	7,844,850	48	75	512	328	163,434	104,598	248
South Staffordshire and Worcestershire	25,103	8,976,000	176,001	191,513	1,425	9,344,939	47	50	534	502	198,828	186,898	414
Monmouth, Somerset, and parts of Glamorgan and Breconshire	30,874	7,152,258	70,453	100,595	7,842	7,331,148	65	333	475	93	112,786	22,015	360
South Wales	43,934	12,097,206	63,899	96,189	—	12,257,294	111	123	396	357	110,426	99,653	288
Scotland, East	40,098	11,667,559	184,459	713,277	535,626	13,100,921	63	71	636	564	207,951	184,520	348
Scotland, West	26,288	6,169,723	199,311	1,723,078	111,065	8,203,177	49	69	536	381	167,411	118,886	317
Totals and Averages	475,329	132,612,063	1,625,586	10,747,227	813,262	145,798,138	811	1,413	586	336	179,777	103,183	3,968

Metalliferous Mines Regulation Acts.

No. 1. A summary by which it appears that in the aggregate in the year 1878, 51,458 persons were employed in and about the mines of Great Britain and Ireland under these Acts, exclusive of those employed at the mines which are classed under the Coal Mines Regulation Act.

Of the total number of persons employed in Great Britain 29,812 were underground, and 20,127 above ground, and in Ireland 812 underground, and 707 above ground.

No. 2. A summary of the mining produce for 1878, given in counties.

By this it appears that in the aggregate the following quantities of mineral were produced :

	Statute Tons.
Arsenic (obtained at the mines)	4,464 14/20
Arsenical pyrites	3,638 2/20
Barytes	21,715 12/20
Beauxite	3,426
Bluestone	538
Building stone	264,662 10/20
Calc spar	3,181 14/20
Cement Stone	2,720 10/20
Chert	3,997
Cobalt ore	98 18/20
Copper ore	54,568 12/20
Copper precipitate	532 3/20
Dross Spar	327 16/20
Flagstone	dressed 8,640, undressed 2,205 10,845
Fluor spar	251 19/20
Gannister	1,071
Gold	702 oz. 16 dwt. 8 gr.
Gold ore	2 qr. 26½ lbs.
Gypsum	74,908
Iron ore	2,559,333 19/20
Iron pyrites	14,759 18/20
Jet	Unknown
Lead ore (dressed)	74,771 2/20
Lead ore (undressed)	1,610
Limestone	478,778
Manganese ore	1,734 4/20
Ochre	2,805 5/20
Phosphate of lime	16
Potter's clay and other clays	60,261
Purbeck Stone for paving, kerbs, &c.	14,411 10/20
Rock salt (exclusive of the white salt made from brine, amounting to 1,500,000 tons)	182,930
Silver	153 oz.
Silver ore	86 5/20
Silver precipitate	8 cwt. 2 qrs. 17 lbs.
Slate and slabs dressed	169,041 1/20
Steatite	57
Tamping stone	60
Tin ore dressed (*black tin*)	13,632 10/20
Tin ore, partially dressed (*white*), estimated to contain 97 5/20 tons of *black tin*	950 9/20
Tin ore undressed (*tin-stuff*), estimated to contain 490 5/20 tons of *black tin*	9,847 17/20
Umber	98
Uranium ore	8 cwts.
Whinstone	17,871
Wolfram	10
Zinc ore	24,682 12/20

No. 3. A summary of fatal accidents and lives lost in and about the mines, showing that in the year 1878, at the mines classed under the Metalliferous Mines Regulation Act in Great Britain and Ireland, the fatal accidents amounted to 74 and the deaths (some of the accidents causing more than one death) to 77. Of these, 69 deaths occurred underground and 8 above ground.

From the summaries just given it appears that in the year 1878 there was one fatal accident amongst every 695 persons employed in and about the mines, and one death amongst every 668 persons so employed.

No. 1.—Summary of Persons Employed in and about the Metalliferous Mines of Great Britain and Ireland in the Year 1878.

Situation of Mines.	Inspector's District.	Underground.				Aboveground.							Total underground and aboveground.
		Male persons.				Ages 8 to 13.		Ages 13 to 18.		Ages above 18.		Total.	
		Ages 12 to 13.	Ages 13 to 16.	Ages above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.		
Northumberland, Cumberland, and the Amounderness or detached part of Lancashire	James Willis	5	118	6,842	6,965	29	—	520	7	—	2,233	2,789	9,754
Durham, Westmoreland, and North Riding of Yorkshire	Thomas Bell	3	69	2,566	2,638	40	1	476	4	5	729	1,255	3,893
East and West Ridings of Yorkshire	F. N. Wardell	—	2	802	804	17	—	127	—	—	621	765	1,569
Cheshire, North and East Lancashire, except the Amounderness or detached part of North Lancashire, and Sussex	J. Dickinson	—	19	389	408	1	—	15	—	8	186	210	618
Lancashire, West	Henry Hall	—	—	19	19	1	—	7	—	—	25	33	52
Derbyshire and Nottinghamshire	Thomas Evans	1	26	836	863	6	5	88	1	1	476	577	1,440
Anglesey, Cardiganshire, Carnarvonshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Radnorshire, Shropshire, Isle of Man	T. F. Evans	—	40	6,880	6,920	121	10	1,122	116	216	3,909	5,494	12,414
South Staffordshire and Worcestershire.	J. P. Baker	—	6	351	357	—	—	1	—	2	115	118	475
Gloucestershire, Herefordshire, Monmouthshire, and parts of Glamorganshire, Somersetshire, and Wiltshire	T. Cadman	11	126	1,194	1,331	—	—	79	—	1	272	352	1,683
Glamorganshire, Pembrokeshire, and Carmarthenshire	Thos. E. Wales	2	22	378	402	10	1	31	6	17	158	223	625
Cornwall, Devonshire, Dorsetshire, and part of Somersetshire	C. Le Neve Foster	9	430	7,721	8,160	373	74	1,666	799	1,454	3,458	7,824	15,984
East Scotland	R. Moore	—	14	440	454	—	—	32	—	3	167	202	656
West Scotland	W. Alexander	—	7	484	491	—	—	68	2	2	213	285	776
Ireland	J. Dickinson	—	15	797	812	29	5	107	46	32	488	707	1,519
Total number of persons employed		31	894	29,699	30,624	627	96	4,339	981	1,741	13,050	20,834	51,458

No. 2.—Summary of Mining Produce under the Metalliferous Mines Regulation Acts, 1872 and 1875, in Great Britain and Ireland in the Year 1878.

ARSENIC (obtained at the mines).

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND and WALES:			
Cornwall	C. Le Neve Foster		$1,676\frac{3}{20}$
Devonshire	„ „		$2,788\frac{11}{20}$
Total produce of Arsenic obtained in mines in Great Britain and Ireland			$4,464\frac{14}{20}$

ARSENICAL PYRITES.

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND and WALES:			
Cornwall	C. Le Neve Foster		$2,958\frac{3}{20}$
Devonshire	„ „		$679\frac{19}{20}$
Total of Arsenical Pyrites obtained in mines in Great Britain and Ireland			$3,638\frac{2}{20}$

BARYTES (Sulphate).

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND and WALES:			
Cumberland	J. Willis		365
Derbyshire	T. Evans		$2,385\frac{15}{20}$
Devonshire	C. Le Neve Foster		$312\frac{14}{20}$
Flintshire	T. F. Evans		244
Northumberland	J. Willis		3,516
Shropshire	T. F. Evans		$3,251\frac{13}{20}$
Yorkshire	F. N. Wardell		2,848
			$12,923\frac{2}{20}$
IRELAND	J. Dickinson		$8,792\frac{10}{20}$
Total produce of Barytes in Great Britain and Ireland			$21,715\frac{12}{20}$

BEAUXITE (Silicate of Alumina).

	Inspector.	Statute Tons.	Total Statute Tons.
IRELAND	J. Dickinson		3,426

BLUE STONE (Zinc, &c.)

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND and WALES:			
Anglesey	T. F. Evans		360
IRELAND	J. Dickinson		178
Total produce of Bluestone for Great Britain and Ireland			538

BUILDING STONE.

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND and WALES:			
Lancashire, West	Henry Hall		Unknown.
Somersetshire	T. Cadman		920
Westmoreland	T. Bell		60
Wiltshire	T. Cadman		145,354
Yorkshire, East and West Ridings	F. N. Wardell	$70,285\frac{10}{20}$	—
„ North Riding	T. Bell	100	—
			$70,385\frac{10}{20}$
SCOTLAND:			
Lanark and Renfrewshire	W. Alexander		47,943
Total produce of Building Stone for Great Britain and Ireland exclusive of Lancashire and Monmouth			$264,662\frac{10}{20}$

Summary of Mining Produce of Great Britain and Ireland in the Year 1878—*continued.*

CALC SPAR.

	Inspector.	Tons.	Total Statute Tons.
ENGLAND AND WALES:			
Derbyshire	Thomas Evans		3,181 14/20

CEMENT STONE.

ENGLAND AND WALES:			
Dorsetshire	C. Le Neve Foster		1,924 10/20
SCOTLAND:			
Lanarkshire	Ralph Moore		796
Total produce of Cement Stone for Great Britain and Ireland			2,720 10/20

CHERT.

ENGLAND AND WALES:			
Derbyshire	T. Evans		3,997

COBALT ORE.

ENGLAND AND WALES:			
Flintshire	T. F. Evans		98 8/20

COPPER ORE.

ENGLAND AND WALES:			
Anglesey	T. F. Evans		1,342 3/20
Cardiganshire	" "		306 15/20
Carnarvonshire	" "		807 10/20
Cornwall	C. Le Neve Foster		37,144 14/20
Devonshire	" "		12,805
Lancashire	J. Willis		144
Merionethshire	T. F. Evans		1
Montgomeryshire	" "		31 10/20
Isle of Man	" "		30
			52,612 12/20
IRELAND	J. Dickinson		1,956
Total produce of Copper Ore in Great Britain and Ireland			54,568 12/20

COPPER PRECIPITATE.

ENGLAND AND WALES:			
Anglesey	T. F. Evans		453 11/20
Cornwall	C. Le Neve Foster		8 12/20
IRELAND	J. Dickinson		70
Total produce of Copper Precipitate in Great Britain and Ireland			532 3/20

DROSS SPAR.

ENGLAND AND WALES:			
Shropshire	T. F. Evans		327 16/20

Summary of Mining Produce of Great Britain and Ireland in the Year 1878—*continued.*

FLAGSTONE.

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND AND WALES:			
Lancashire	J. Dickinson		Unknown.
Yorkshire	T. Bell	(dressed)	8,640
"	"	(undressed)	2,205
Total produce of Flagstone in Great Britain and Ireland exclusive of Lancashire			10,845

FLUOR SPAR.

ENGLAND AND WALES:			
Derbyshire	Thomas Evans		$244\frac{12}{20}$
Devonshire	C. Le Neve Foster		$7\frac{7}{20}$
Total produce of Fluor Spar in Great Britain and Ireland			$251\frac{19}{20}$

GANNISTER.

SCOTLAND:			
Lanarkshire	W. Alexander		1,071

GOLD.

			Oz.	dwts.	grs.
ENGLAND AND WALES:					
Merionethshire	T. F. Evans		697	12	15
IRELAND	J. Dickinson		5	3	17
Total produce of Gold in Great Britain and Ireland			702	16	8

GOLD ORE.

			qrs.	lbs.
IRELAND	J. Dickinson		2	$26\frac{1}{2}$

GYPSUM.

ENGLAND AND WALES:			
Derbyshire	Thomas Evans		72,220
Nottinghamshire	Do.		
Sussex	J. Dickinson		2,688
Total produce of Gypsum in Great Britain and Ireland			74,908

IRON ORE.

ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		$1,291\frac{10}{20}$
Cumberland	J. Willis		1,322,028
Devonshire	C. Le Neve Foster		3,493
Durham	T. Bell		19,204
Flintshire	T. F. Evans		378
Gloucestershire	T. Cadman		67,958
Glamorganshire	T. E. Wales		$53,053\frac{18}{20}$
Lancashire	J. Willis		906,994
Somersetshire	C. Le Neve Foster		$40,115\frac{6}{20}$
			$2,414,515\frac{14}{20}$
SCOTLAND:			
Ayrshire	W. Alexander		7,568
IRELAND	J. Dickinson		$137,250\frac{5}{20}$
Total produce of Iron Ore in Great Britain and Ireland under the Metalliferous Mines Regulation Acts			$2,559,333\frac{19}{20}$

Summary of Mining Produce of Great Britain and Ireland in the Year 1878—*continued.*

IRON PYRITES.

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND AND WALES:			
Anglesey	T. F. Evans		31
Carnarvonshire	Ditto		773
Cornwall	L e Neve Foster		232 18/20
IRELAND	J. Dickinson		13,723
Total produce of Iron Pyrites in Great Britain and Ireland under the Metalliferous Mines Regulation Acts			14,759 18/20

LEAD ORE (DRESSED).

ENGLAND AND WALES:			
Cardiganshire	T. F. Evans		5,846
Carmarthenshire	T. E. Wales		574
Carnarvonshire	T. F. Evans		2,036 17/20
Cornwall	C. Le Neve Foster		1,345 18/20
Cumberland	J. Willis		2,592
Denbighshire	T. F. Evans		3,136 16/20
Derbyshire	T. Evans		7,079 15/20
Devonshire	C. Le Neve Foster		233 14/20
Durham	T. Bell		11,961
Flintshire	T. F. Evans		4,155 11/20
Glamorganshire	T. E. Wales		42 6/20
Isle of Man	T. F. Evans		3,844 19/20
Merionethshire	Ditto		6
Montgomeryshire	Ditto		6,980 9/20
Northumberland	J. Willis	4,673	—
,,	T. Bell	165	—
			4,838
Pembrokeshire	T. E. Wales		550 5/20
Radnorshire	T. F. Evans		20
Shropshire	Ditto		6,164 14/20
Somersetshire	T. Cadman		524
Yorkshire, North Riding	T. Bell	4,225	—
,, West Riding	F. N. Wardell	1,271 11/20	—
			5,496 11/20
Westmoreland	T. Bell		1,581
			69,009 15/20
SCOTLAND:			
Lanarkshire	R. Moore	2,382 7/20	
Argyle, Dumfries, and Kirkcudbright.	W. Alexander	1,824	
			4,206 7/20
IRELAND	J. Dickinson		1,555
Total produce of Lead Ore (dressed) in Great Britain and Ireland			74,771 2/20

LEAD ORE (UNDRESSED).

ENGLAND AND WALES:			
Durham	T. Bell		1,413
Northumberland	Ditto		197
Total produce of undressed Lead Ore in Great Britain and Ireland			1,610

Summary of Mining Produce of Great Britain and Ireland in the Year 1878—*continued.*

LIMESTONE.

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND AND WALES:			
Denbighshire	T. F. Evans		12,748
Derbyshire	T. Evans		2,864
Flintshire	T. F. Evans		605
Lancashire	J. Dickinson		4,415
Shropshire	T. F. Evans		12,316
Staffordshire, Worcestershire	J. P. Baker		160,199
			193,147
SCOTLAND:			
Ayrshire, Dumbartonshire, Dumfriesshire, Stirling, Renfrewshire	W. Alexander		93,910
Edinburgh	R. Moore	151,594	—
Fife	Ditto	12,140	—
Lanark (East)	Ditto	18,805	—
Linlithgow	Ditto	9,182	—
			191,721
			285,631
Total produce of Limestone in Mines in Great Britain and Ireland, (except Northumberland, included in Coal Mines)			478,778

MANGANESE ORE.

ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		$144\frac{4}{20}$
Derbyshire	T. Evans		192
Devonshire	C. Le Neve Foster		1,348
			$1,684\frac{4}{20}$
IRELAND	J. Dickinson		50
Total produce of Manganese Ore in Great Britain and Ireland			$1,734\frac{4}{20}$

OCHRE.

ENGLAND AND WALES:			
Anglesey	T. F. Evans		$2,302\frac{7}{20}$
Cornwall	C. Le Neve Foster		70
Derbyshire	T. Evans		$32\frac{12}{20}$
Glamorganshire	T. E. Wales		$300\frac{6}{20}$
			$2,705\frac{5}{20}$
IRELAND	J. Dickinson		100
Total produce of Ochre in Great Britain and Ireland			$2,805\frac{5}{20}$

PHOSPHATE OF LIME.

ENGLAND AND WALES:			
Montgomeryshire	T. F. Evans		16

POTTER'S CLAY AND OTHER CLAYS.

ENGLAND AND WALES:			
Devonshire	C. Le Neve Foster		26,233
Dorsetshire	Ditto		34,028
			60,261

Summary of Mining Produce of Great Britain and Ireland for the Year 1878—*continued.*

PURBECK STONE.

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND AND WALES:			
Dorsetshire	C. Le Neve Foster	(dressed stone)	12,939 1/20
Do.	Ditto	(undressed stone)	1,472
Total produce of Purbeck Stone			14,411 1/20

ROCK SALT.

ENGLAND AND WALES:			
Cheshire	J. Dickinson		152,829
IRELAND	Ditto		30,101
			182,930

SILVER.

			Oz.
ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		153

SILVER ORE.

ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		86 5/20

SILVER PRECIPITATE.

			Cwt. qrs. lbs.
ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		8 2 17

SLATE AND SLABS (DRESSED).

ENGLAND AND WALES:			
Carnarvonshire	T. F. Evans		3,168 11/20
Cornwall	C. Le Neve Foster		364
Devonshire	Ditto		2,266 1/20
Merionethshire	T. F. Evans		157,289
Westmoreland	T. Bell		2,193
Yorkshire	F. N. Wardell		560
			165,841 1/20
SCOTLAND.			
Perthshire	R. Moore		500
IRELAND	J. Dickinson		2,700
Total produce of dressed Slate and Slabs in Mines in Great Britain and Ireland			169,041 1/20

STEATITE.

IRELAND	J. Dickinson		57

TAMPING STONE.

ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		60

TIN ORE, DRESSED (*Black Tin*).

ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		13,585 3/20
Devonshire	Ditto		47 7/20
			13,632 1/20

Summary of Mining Produce of Great Britain and Ireland in the Year 1878—*continued.*

TIN ORE, PARTIALLY DRESSED.

	Inspector.	Statute Tons.	Total Statute Tons.
ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		950 9/20 *

TIN ORE, UNDRESSED.

ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		9,847 17/20 †

UMBER.

ENGLAND AND WALES:			
Northumberland	J. Willis		98

URANIUM ORE.

ENGLAND AND WALES:			Cwts.
Cornwall	C. Le Neve Foster		8

WHINSTONE.

ENGLAND AND WALES:			
Durham	T. Bell		3,693
Northumberland	J. Willis		1,576
Yorkshire (North Riding)	T. Bell		12,602
			17,871

WOLFRAM.

ENGLAND AND WALES:			
Cornwall	C. Le Neve Foster		10

ZINC ORE.

ENGLAND AND WALES:			
Cardiganshire	T. F. Evans		308
Carnarvonshire	Ditto		420 12/20
Cornwall	C. Le Neve Foster		4,277 2/20
Cumberland	J. Willis		1,576
Denbighshire	T. F. Evans		2,984
Flintshire	Ditto		2,656 1/20
Isle of Man	Ditto		9,526
Montgomeryshire	Ditto		2,208 6/20
Shropshire	Ditto		485 11/20
Yorkshire	F. N. Wardell		5 13/20
			24,447 12/20
SCOTLAND:			
Kirkcudbright	W. Alexander		235
Total produce of Zinc Ore in Great Britain and Ireland			24,682 12/20

* Estimated to contain 97¼ tons of *Black Tin.*

† Estimated to contain 490¼ tons of *Black Tin.*

No. 3.—Summary of Separate Fatal Accidents in and about the Metalliferous Mines of Great Britain and Ireland during the Year 1878.

Names of Districts.	Explosions of Fire-damp.	Falls of Ground.	In Shafts.									Miscellaneous Underground.									On Surface.				Gross Total.
			Overwinding.	Ropes and Chains Breaking.	Whilst ascending or descending by Machinery.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total { Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and detached part of Lancashire	–	7	–	–	4	3	–	2	–	1	10	3	–	–	–	–	–	–	1	4	–	–	1	1	22
Durham, Westmoreland, and North Riding of Yorkshire	–	4	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	5
East and West Ridings of Yorkshire	–	1	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Cheshire, North and East Lancashire, except the Amounderness or detached part of North Lancashire, and Sussex	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	1
Lancashire, West	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Derbyshire and Nottinghamshire	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Anglesey, Cardiganshire, Carnarvonshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Radnorshire, Shropshire, Isle of Man	–	1	–	–	–	–	–	1	–	–	1	7	–	–	–	–	1	–	–	8	2	–	–	2	12
South Staffordshire and Worcestershire	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	1
Gloucestershire, Herefordshire, Monmouthshire, and parts of Glamorganshire, Somersetshire, and Wiltshire	–	1	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	1	1	–	–	–	–	3
Glamorganshire, Pembrokeshire, and Carmarthenshire	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Cornwall, Devonshire, Dorsetshire, and part of Somersetshire	–	7	–	–	1	–	–	1	–	2	4	3	–	–	–	–	–	–	2	5	2	1	2	5	21
Eastern District of Scotland	–	2	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Western do.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ireland	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Total Separate Fatal Accidents in 1878	–	27	–	–	6	3	–	6	–	3	18	15	–	–	–	–	1	–	5	21	4	1	3	8	74
Ditto in the preceding year	–	36	–	–	1	2	3	7	3	3	18	8	–	–	–	1	1	1	10	22	3	–	8	11	87

Decrease - 13

No. 3.—Summary of Deaths from the aforesaid Accidents in and about the Metalliferous Mines of Great Britain and Ireland during the Year 1878.

Names of Districts.	Explosions of Fire-damp.	Falls of Ground.	In Shafts.									Miscellaneous Underground.									On Surface.				Gross Total.
			Overwinding.	Ropes and Chains Breaking.	Whilst ascending or descending by Machinery.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total {Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and detached part of Lancashire	–	7	–	–	4	3	–	2	–	1	10	3	–	–	–	–	–	–	1	4	–	–	1	1	22
Durham, Westmoreland, and North Riding of Yorkshire	–	4	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	5
East and West Ridings of Yorkshire	–	1	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Cheshire, North and East Lancashire, except the Amounderness or detached part of North Lancashire, and Sussex	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	1
Lancashire, West	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Derbyshire and Nottinghamshire	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Anglesey, Cardiganshire, Carnarvonshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Radnorshire, Shropshire, Isle of Man	–	1	–	–	–	–	–	1	–	–	1	8	–	–	–	–	1	–	–	9	2	–	–	2	13
South Staffordshire and Worcestershire	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	1
Gloucestershire, Herefordshire, Monmouthshire, and parts of Glamorganshire, Somersetshire, and Wiltshire	–	1	–	–	2	–	–	–	–	–	2	–	–	–	–	–	–	–	1	1	–	–	–	–	4
Glamorganshire, Pembrokeshire, and Carmarthenshire	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Cornwall, Devonshire, Dorsetshire, and part of Somersetshire	–	7	–	–	1	–	–	1	–	2	4	4	–	–	–	–	–	–	2	6	2	1	2	5	22
Eastern District of Scotland	–	2	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Western do.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ireland	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Total Lives lost in 1878	–	27	–	–	7	3	–	6	–	3	19	17	–	–	–	–	1	–	5	23	4	1	3	8	77
Ditto in the preceding year	–	41	–	–	1	2	3	9	4	2	21	9	–	–	1	1	1	2	10	24	3	–	8	11	97

Decrease - 20

Mr. Dickinson's Report.

Report on the Inspection of Mines in the District comprising North and East Lancashire under the Coal Mines Regulation Act, 1872; and Cheshire, Sussex, and North and East Lancashire except Amounderness or the detached part of North Lancashire, under the Metalliferous Mines Regulation Acts, 1872 and 1875; also Ireland under each of the Acts; for the Year 1878.—By Joseph Dickinson, Esq., F.G.S.

Pendleton, Manchester, 28th March 1879.

Sir,

I have the honour to make the following report of my proceedings as an Inspector of Mines during the year 1878.

In the duties of my district I have been assisted, as before, by Mr. Joseph S. Martin, and I have in addition attended to matters which have been referred to me as the Chief Inspector of Mines.

The report is divided into the following heads; namely,

Chapter 1. General matters.
" 2. The metalliferous mines of Cheshire, Sussex, and North and East Lancashire, except the detached part of North Lancashire.
" 3. Ireland, coal and metalliferous mines.
" 4. North and East Lancashire, coal mines.

CHAPTER 1.

General Matters.

Inspection.

The official duties have received daily attention. During the year 1878, 618 visits of inspection were made to mines between the assistant inspector and myself. Of these 221 were by me and 397 by the assistant inspector; 75 of those by me and 216 by him being underground. Forty-five inquests or adjourned inquests were attended, 26 of them being by me and 19 by the assistant. A voluminous correspondence, in which he assists as far as possible, but all of which passes through my hands, was daily attended to without any allowed clerical assistance. Many interviews at mining offices and elsewhere were held with those acting in the management and with representatives of the miners. Briefs were prepared with the lawyers and courts attended in 32 prosecutions for contraventions of the regulations. Other duties falling almost entirely upon myself were also attended to, such as: Attendances at the Home Office; meetings of the board for the examination of candidates for colliery manager's certificate; inquiries respecting the establishment of Special Rules, and the granting of exemptions; making special reports upon mining matters referred to me from the Home Office; special visits into other districts; attending inquiries as to spontaneous combustion of coal cargo at sea; and into the qualification of a colliery manager to hold his certificate. The travelling required in the discharge of these duties amounted to, in my case 13,961 miles, 2,727 being by road and 11,234 by rail and water; and in the assistant's case to 10,841 miles, 2,720 being by road and 8,121 by rail and water.

In the discharge of these multifarious duties the inspections and inquiries relating to intimations of danger and reports of accidents receive attention first, and less pressing matters afterwards. Two hundred and thirty-nine accidents of which 59 were fatal and 180 non-fatal at the coal and metalliferous mines of North and East Lancashire, the coal and metalliferous mines of Ireland, and the metalliferous mines of Cheshire and Sussex were all duly investigated except a few evidentally pure casualties. Several of the inspections were of the same mine, upon different occasions, and being seldom confined to only one object, the

specific cause of each visit cannot always be assigned. In round numbers, about one half of the visits by myself and three fourths by the assistant inspector were casual and the others respecting accidents and intimations of danger. Of the 32 prosecutions only two were in connexion with accidents. Some of the inspections and inquiries, as stated in previous reports, occupy but little time and are easily made, whilst others are long and arduous. The mere numbers of them, therefore, do not afford an infallible test for comparisons of work done at other times, either in this or in any other district. Those made below ground in extensive mines do not, of course, extend on ordinary occasions to every part of the workings, because that would occupy several days, and usually the general state of the mine may be ascertained by visiting the apparently weak points and from inquiry. But whether the visit be above ground or underground, it usually comprises, either by inspection or inquiry, the state of the workings, ventilation, engines, machinery, fittings, fencings, plans, report books, publication of official abstracts, rules, and notices, and the regulations generally, including those affecting the employment of women and young persons.

The miners of this district seldom make formal inspections or examine the report books, as they are empowered to do, on their own behalf; but the Special Rules established at all the mines under the Coal Mines Act, and at some mines under the Metalliferous Mines Act, require every person employed in or about the mine to give those acting in the management immediate information of any breach of the regulations, or of any circumstance likely to produce danger, and this duty is apparently fairly complied with. Without such co-operation in a dangerous occupation like mining, with things in a constant state of change as mineral is sent out, and with some of the appliances in the personal care and use of the miners, it would be impossible for those in the management to maintain reasonable security. With safety thus hanging upon the united action of thousands of persons working in thousands of miles of underground workings in mines lying far apart in wide districts, how extravagant is the conception (as set forth in the recently consolidated and enlarged instructions), and how illusory as well as mischievous it is likely to prove, if the miners be led to believe that an inspector acting alone and without such co-operation could, even remotely, superintend the operations in hundreds of mines. The inspector is in his district attending to what transpires, and in order that matters may be referred to him. All complaints and intimations of danger are attended to confidentially. Many such intimations are sent and danger thus averted. But if unrectified danger be not intimated to him the momentary opportunity will probably slip by, and it will be vain afterwards to inquire "when was the inspector last in the pit?"

Contraventions by Workpersons.

Various modes continue to be resorted to by those acting in the management for the maintenance of discipline amongst the workpersons, and in several instances prosecutions have been instituted before the magistrates, but there being no provision in the Acts for making even these prosecutions known to an inspector no correct list of them can be given.

Contraventions by those acting in the management.

In 32 instances prosecutions have been taken by me against persons acting in the management for contraventions during the year. Two of these were in connexion with accidents; and 30 without any accident having happened, but where the contraventions appeared so obvious as to be inexcusable, the majority of them being at small mines. Of the two connected with accidents, one was where a person was found dead at the bottom of an insecurely fenced old coal pit shaft, and the other where two lives were lost by an inundation of water from former workings, which became holed into without boreholes in advance. In the former the landowner was fined; but in the latter the magistrates did not consider that the manager had sufficient information before him to prevent the accident, the plan of the former working having had a wrong meridian or north point marked upon it by a mistake in the surveyor's office. In the 30 instances where no accident had happened, penalties and costs were imposed in 29 cases and costs in the other.

The convictions were against:—

Two landowners for not having old shafts securely fenced.

Four mine owners, 1 agent, 4 managers, and 2 underlookers, for not providing adequate ventilation; 3 of the cases being as to fire-damp, and 8 as to choke-damp or black-damp.

Five persons for the time being in charge of the mine, for not withdrawing workpersons from parts found dangerous from gas.

One owner, for not appointing a competent person to examine and report in a book as to the state of the ventilation.

One appointed person, for not making the report in a book, as to the state of the ventilation.

One owner, and 1 manager, for not having the report made in a book as to the state of the working places and travelling roads.

One person in charge, for not having the ventilating furnace lighted.

One manager, for not having the Special Rules exhibited where they might be conveniently read by the workpersons.

One manager, for not having the indicator attached to the winding engine to show the position of the load in the shaft, whilst raising or lowering persons.

Two owners, for not keeping a plan of the workings.

One owner, for allowing an iron blasting pricker to be in the mine, the mine being a coal mine.

One owner, for allowing boys to work beyond the number of hours.

Two owners, for not paying the miners by the weight of mineral gotten, exemption not being obtained.

The penalties, amounting to 60*l.* 12*s.*, for the contraventions have been reported to the Receiver of Government Fines, in order that they may be paid into the receipt of Her Majesty's Exchequer, and carried to the Consolidated Fund.

Accidents.

The fatal accidents duirng 1878 were:—In the coal mines of North and East Lancashire, 54, with the loss of 99 lives. In Ireland 2, with the loss of 2 lives in the coal mines, and 2 with the same loss in the metalliferous mines. In the metalliferous mines of Cheshire 1, with the loss of 1 life. As compared with previous years the accidents are below the average, but the deaths, owing to the 43 lost in 1 explosion, are above the average.

Electric Lighting.

The electric light has lately been tried by Messrs. Verdin, in the lighting of their Adelaide Rock Salt Mine at Northwich, but the success was not such as to induce its continuance at present.

Safety Lamps.

Many of the so-called safety lamps, including the Davy, being unsafe in explosive currents, attention is being given to the subject with the view of taking increased precautions.

Accidents to Youths and Boys.

Special attention having been called by circular letter from the Home Office to the large number of accidents in collieries in certain districts, especially amongst boys and youths, who are sometimes killed, and sometimes terribly mutilated, mainly due to slips of roof and coal, and to runaway trams, and tubs underground, it seems proper to say that in this district during the past year no fatal accident of either kind has taken place to any boy or youth under 16 years of age. This is creditable to the management, and the miners, and to the boys themselves. It is especially so about Manchester, where the workings have reached a depth of about 900 yards, and the seams abound with slippery faces, from which coal often falls without warning, and the dip is so steep that many of the tubs in which the coal is sent out have to be moved two or three times by machinery before reaching the surface. Most of the sufferers who lost their lives in this district by accidents of all kinds were in the prime of life. In 10 of the separate accidents at the coal mines the ages varied between 60 and 72 years; and in the only one fatal accident at the rock salt mines of Cheshire the sufferer was 76.

Metalliferous Mines Inspection.

All the inspectors and assistant inspectors of coal mines having been formally appointed as inspectors under the Metalliferous Mines Act, and the appointments having appeared in the London Gazette of Friday, March 29, 1878, it is proper to state that on the 3rd February 1873, I being then an inspector of coal mines, was duly appointed an inspector of metalliferous mines, and that my having so acted since that date was in accordance with the statute and strictly legal.

GREAT BRITAIN from 1851 with IRELAND from 1874.

TABLE showing the Number of Separate FATAL ACCIDENTS, together with the Number of PERSONS employed per each ACCIDENT in each Year under the Coal Mines Acts.

	Accidents causing one or more Deaths.						Persons employed.	Ratio of Persons employed to each separate Fatal Accident.					
YEAR.	Fire-damp Explosion.	Roof and Sides Falling.	Shaft.	Miscellaneous Underground.	Miscellaneous Surface.	TOTAL.	Above ground and below ground.	Fire-damp Explosion.	Roof and Sides Falling.	Shaft.	Miscellaneous Underground.	Miscellaneous Surface.	TOTAL.
1851	98	307	187	68	38	698	216,217	2,206	704	1,156	3,183	5,690	310
1852	91	333	175	79	43	721	222,843	2,449	669	1,273	2,820	5,182	309
1853	89	354	206	86	42	777	229,468	2,578	648	1,114	2,668	5,463	295
1854	87	370	253	94	57	861	236,094	2,714	638	933	2,511	4,142	274
1855	99	388	203	114	43	847	242,719	2,452	625	1,195	2,129	5,644	286
1856	72	388	189	94	58	801	249,345	3,463	642	1,319	2,652	4,299	311
1857	74	360	157	120	49	760	255,971	3,459	711	1,630	2,134	5,224	337
1858	70	348	145	111	36	710	262,596	3,751	754	1,811	2,366	7,294	370
1859	70	384	165	122	54	795	269,222	3,846	701	1,631	2,207	4,985	338
1860	70	379	157	115	48	769	275,847	3,940	728	1,757	2,398	5,747	359
Average of 10 years ending 1860	820	3,611	1,837	1,003	468	7,739	2,460,322	3,000	681	1,339	2,453	5,257	318
1861	61	413	148	123	66	811	282,473	4,630	684	1,908	2,296	4,280	348
1862	55	402	109	121	51	738	291,000	5,291	724	2,669	2,405	5,706	394
1863	51	398	126	126	56	757	299,000	5,862	751	2,373	2,373	5,339	393
1864	59	380	158	117	63	777	307,542	5,213	809	1,946	2,628	4,881	396
1865	64	368	144	169	92	837	315,451	4,929	857	2,190	1,866	3,429	377
1866	71	345	153	187	101	857	320,663	4,516	829	2,096	1,715	3,175	374
1867	56	440	132	197	82	907	333,116	5,948	857	2,523	1,691	4,062	367
1868	44	432	122	188	74	860	346,820	7,882	803	2,843	1,845	4,687	403
1869	48	451	123	159	73	854	345,446	7,197	766	2,808	2,172	4,732	404
1870	56	402	118	174	80	830	350,894	6,266	873	2,974	2,017	4,386	423
Average of 10 years ending 1870	565	4,031	1,333	1,561	738	8,228	3,192,405	5,650	792	2,394	2,045	4,326	388
1871	52	426	118	161	69	826	370,881	7,132	870	3,143	2,303	5,375	448
1872	62	445	131	179	77	894	418,088	6,743	939	3,191	2,335	5,429	468
1873	44	474	158	211	86	973	512,199	11,641	1,080	3,242	2,427	5,955	526
1874	44	403	145	200	103	895	538,829	12,246	1,337	3,716	2,694	5,231	602
1875	41	440	153	196	97	927	535,845	13,069	1,217	3,502	2,733	5,524	578
1876	42	430	120	146	101	839	514,532	12,250	1,196	4,287	3,524	5,094	613
1877	45	432	117	172	98	864	494,386	10,986	1,144	4,225	2,874	5,044	572
1878	31	456	94	146	84	811	475,329	15,333	1,042	5,056	3,255	5,658	586

GREAT BRITAIN from 1851 with IRELAND from 1874.

TABLE showing the Number of DEATHS by the ACCIDENTS, together with the Number of COAL MINERS employed per each DEATH, in each Year since the Commencement of the Inspection of Coal Mines.

	Deaths caused by the Accidents.						Persons employed.	Ratio of Persons employed to each Death.					
YEAR.	Fire-damp Explosion.	Roof and Sides Falling.	Shaft.	Miscellaneous Underground.	Miscellaneous Surface.	TOTAL.	Above ground and below ground.	Fire-damp Explosion.	Roof and Sides Falling.	Shaft.	Miscellaneous Underground.	Miscellaneous Surface.	TOTAL.
1851	321	327	219	73	44	984	216,217	673	661	987	2,961	4,914	219
1852	264	349	209	116	48	986	222,843	844	638	1,066	1,921	4,642	226
1853	214	370	236	94	43	957	229,468	1,072	620	972	2,441	5,336	219
1854	210	389	290	99	57	1,045	236,094	1,124	606	814	2,394	4,142	225
1855	146	407	229	127	46	955	242,719	1,662	596	1,059	1,911	5,276	254
1856	236	400	216	114	61	1,027	249,345	1,056	623	1,154	2,187	4,087	242
1857	377	372	175	141	54	1,119	255,971	678	688	1,462	1,815	4,740	228
1858	215	366	172	140	38	931	262,596	1,221	717	1,526	1,875	6,910	282
1859	95	399	191	160	60	905	269,222	2,833	674	1,409	1,682	4,487	297
1860	363	388	182	122	54	1,109	275,847	759	710	1,515	2,261	5,108	248
	2,441	3,767	2,119	1,186	505	10,018	2,460,322	1,008	653	1,161	2,074	4,872	245
1861	119	427	164	163	70	943	282,473	2,374	661	1,722	1,733	4,035	300
1862	190	422	137	332	52	1,133	291,000	1,532	689	2,124	876	5,596	257
1863	163	407	147	134	56	907	299,000	1,834	734	2,034	2,231	5,339	330
1864	94	395	184	125	69	867	307,542	3,271	778	1,671	2,460	4,457	355
1865	168	381	163	179	93	984	315,451	1,877	828	1,935	1,762	3,392	320
1866	651	361	162	203	107	1,484	320,663	492	888	1,980	1,580	2,997	216
1867	286	449	158	211	86	1,190	333,116	1,165	742	2,108	1,579	3,873	280
1868	154	444	132	204	77	1,011	346,820	2,252	781	2,627	1,700	4,504	343
1869	257	466	129	179	85	1,116	345,446	1,344	741	2,678	1,930	4,064	310
1870	185	411	129	186	80	991	350,894	1,897	854	2,720	1,886	4,386	354
	2,267	4,163	1,505	1,916	775	10,626	3,192,405	1,408	767	2,121	1,666	4,119	300
1871	269	435	123	176	72	1,075	370,881	1,378	852	3,015	2,107	5,151	345
1872	154	456	155	217	78	1,060	418,088	2,714	916	2,697	1,926	5,360	394
1873	100	491	171	221	86	1,069	512,199	5,122	1,043	2,995	2,317	5,955	479
1874	166	413	154	214	109	1,056	538,829	3,245	1,304	3,498	2,517	4,943	510
1875	288	459	172	227	98	1,244	535,845	1,860	1,167	3,115	2,360	5,467	430
1876	95	449	129	149	111	933	514,532	5,416	1,145	3,988	3,453	4,635	551
1877	345	448	129	187	99	1,208	494,386	1,433	1,103	3,832	2,643	5,014	409
1878	586	469	111	161	86	1,413	475,329	811	1,013	4,282	2,952	5,527	336

Certificating colliery managers.

The board for examination of candidates for certificates of competency as colliery managers continues to work satisfactorily.

The present members are :—

Owners: John Knowles, Esq., Pendlebury, near Manchester; Edward Pilkington, Esq., Clifton, near Manchester; Peter Pickup, Esq., Townley Colliery, Burnley. Mining engineers: Isaiah Booth, Esq., Hollinwood, near Manchester; H. H. Bolton, Esq., Newchurch; Clifford Smith, Esq., Bridgewater Collieries, Walkden, near Bolton. Miners: Mr. Samuel Broome, 217, Tyldesley Road, Hindsford, near Tyldesley; Mr. Isaac Wardle, Stoneclough, near Manchester; Mr. James Entwistle, 81, Egerton Street, Farnworth, near Bolton. Ex-officio: Joseph Dickinson, Esq., H.M. Inspector of Mines, Pendleton, Manchester. Secretary: Maskell Wm. Peace, Esq., solicitor, Wigan.

At the board meeting held at the Assize Courts, Manchester, on the 5th November 1878, Messrs. John Waddington, John Ridyard, and Herbert Fletcher were re-appointed examiners. The Board at the same time unanimously expressed their regret at the decision of the Home Office in prohibiting the publication of the questions after each examination, as the doing so would, in the opinion of the board, spread a knowledge of what is required of candidates.

The annual examination was held on the 19th December 1878. Seventy-six candidates had obtained authorizations to present themselves, 60 appeared, 36 of whom belonged to Lancashire, 17 were successful, of whom 11 belonged to Lancashire. The numbers at the examinations under this board have been :

In 1874—16	candidates,	of whom	4	passed.
1875—47	do.	„	21	do.
1876—47	do.	„	20	do.
1877—61	do.	„	24	do.
1878—60	do.	„	17	do.

Surplus Hartley Fund.

The portion of the surplus Hartley fund sent to this district for the relief of sufferers by colliery accidents, for which I have acted as the honorary secretary, now amounts with interest to 2,389*l.* 19*s.* 8*d.* Nothing has been drawn out, and in the event of the endeavours which are being made to establish a general fund for the above-named object in the district being successful, the committee and the trustees would doubtless see no objection to paying over the whole amount. It is deposited in the Manchester branch of the National Provincial Bank of England, the Right Honourable the Earl of Wilton and Oliver Heywood, Esq., being the trustees.

General results accompanying the Coal Mines inspection.

Annexed is a copy of the table prepared by me some years ago, and now brought up to the present time, showing the ratio of separate fatal accidents and deaths to the number of persons employed in and about the mines under the Coal Mines Acts in Great Britain from 1851 with Ireland from 1874. The table shows many ups and downs, with an average improvement from one separate accident amongst every 318 persons during the first decade to only one in nearly double that number, and from one death by accident amongst nearly every 245 persons during the first decade to only one in 300 during the second decade, and more favourable since. The accidents in 1878 maintain the favourable ratio, but the deaths both in 1878 and in the preceding year show an increased ratio. The points which appear to require most careful watching are: whether the stringent regulations upon managers may be causing owners, agents, and mining engineers, who formerly supplied the skill in many cases, to retire from the responsibility, without that want being fully supplied, and whether the marked diminution which is taking place in the number of youths and boys under 16 years of age below ground may be seriously lessening the number of practical learners, as was apprehended, the diminution in round numbers since 1874 being one third amongst those between 13 and 16 years of age, and one half amongst those between 12 and 13, and the same between 10 and 12 years of age.

CHAPTER 2.

Cheshire, Sussex, and North and East Lancashire, excepting the Amounderness or detached part of North Lancashire.

Mines classed under the Metalliferous Mines Act.

Cheshire.

These mines now consist only of the rock salt mines at Northwich and Winsford, the copper mine at Alderley Edge having been abandoned in 1878.

At the rock salt mines 274 persons were ordinarily employed, of whom 235 were below ground and 39 above ground. Of those below ground 19 were between 13 and 16 years of age, and 216 above 16 years. Of those above ground 1, a male, was between 13 and 18 years, and 8 females and 30 males above 18. The produce of rock salt sold, treated, or used was 152,829 tons, which is a decrease of 26,588 tons as compared with the preceding year, but of only 1,702 tons as compared with the year before that. Brine pits not being comprised by the Act, the produce of white salt manufactured from natural brine has not been returned, but the quantity is said to have been 1,500,000 tons, or nearly the same as during the preceding year, which is under the average. One fatal accident occurred in 1878. It happened on the 23rd January, at Meadowbank Rock Salt Mine, Winsford, to John Clough, miner, aged 76 years, he having got burned by dropping his candle into powder whilst preparing a straw for firing a shot, from which he died 16th February following. Two non-fatal accidents also happened, both being in the Adelaide Rock Salt Mine, near Northwich; one of the persons being hurt by a truck, and the other by some charging powder becoming ignited by a shot. The submerging of land with serious damage and occasional destruction of buildings by landslips consequent upon the extraction of salt still continues, and although many restorations are made the encroachments are quite apparent, and no recompense appears to be paid.

At the Alderley Edge Copper Mine the persons employed averaged 7 for the year. All of them were above ground, one being a male under 13 years, and the others 6 males above 18. No mineral was returned as sold, treated, or used. The mine being abandoned, and the record plan sent to the Home Office, the following are some particulars. The mine, it appears, was known to and worked by the ancients. The ore was found sparsely amongst soft sandstone of a whitish colour, called Keuper. The per-centage contained by the stone varied from about three-quarters to two per cent. of copper ore, which existed chiefly as a carbonate with a little oxide of copper, the per-centage of copper averaging about one and one fifth. The separation of the copper was effected by solution in hydrochloric acid and precipitation by iron, the iron being occasionally precipitated from the solution afterwards as an hydrated peroxide, which was used for purifying gas. A little carbonate and sulphide of lead, and a little cobalt and nickel were also at one time extracted, but these were only in small quantities. The ores in the sandstone were distinguishable by blue and dark spots, and they were found chiefly in flats or beds near faults or veins. The section of the strata containing the ore is as follows:

Top bed sandstone with ore, also pebbles	6 to 20 feet.
Variegated marl	1 to 3 feet.
Middle bed, sandstone with ore	6 to 20 feet.
Variegated marl	6 to 20 feet.
Bottom bed, sandstone with ore	10 to 30 feet.
A pebble bed	Occasionally.
Soft red and variegated sandstone, unmetalliferous, of great thickness.	

The entrance to the mine on the dip was by a descending engine plane, which went towards the main road leading from Alderley Edge Railway Station to Alderley village. The entrance on the rise was by a short descending engine plane, and by levels and shafts, from which an exploration drift beyond the workings extended through to the opposite side of the hill in the unmetalliferous sandstone. The property belongs to Lord Stanley of Alderley, upon whom, in the absence of a lessee of the minerals, will devolve the keeping of shafts securely fenced.

The list, produce, &c., of the rock salt mines will be found at the end of this chapter.

Sussex.

The only mine in this portion of the district is that at Mountfield, near Battle, belonging to the Sub-Wealden Gypsum Company, Limited. The returns made to me for 1878 show that 16 male persons, all above 16 years of age, were employed underground, and 12, all

males above 18 years of age, were employed above ground. Also that 2,688 tons of gypsum, of which 2,475 tons were dressed, were sold, treated, or used. One miner got his foot hurt by gypsum falling in the mine.

Further particulars will be found in the list at the end of this chapter.

North and East Lancashire, excepting the detached part of North Lancashire.

These mines, classed under the Metalliferous Mines Act, consist of one limestone mine at Ardwick, Manchester, and 20 stone mines, chiefly flagstone and building stone, at Over Darwen, Whitworth, and Rossendale.

At the Ardwick Limestone Mine 12 persons were employed, of whom 8 males above 16 years of age were underground, and 4, also males, above 18 years, above ground. The quantity of limestone sold, treated, or used was 4,415 tons.

At the stone mines 297 persons were employed, of whom 149, males above 16 years of age, were below ground, and 14 males between 13 and 18 years, and 134 males above 18 years were above ground.

A list of these mines will be found at the end of this chapter.

MINES CLASSED UNDER THE METALLIFEROUS MINES REGULATION ACT.

LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in the portion of Mr. DICKINSON'S DISTRICT, consisting of CHESHIRE, SUSSEX, and NORTH and EAST LANCASHIRE, excepting the detached part of NORTH LANCASHIRE, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878. Jan. 23	1	Meadow Bank Rock Salt.	Winsford, Cheshire -	H. E. Falk - -	John Clough -	Miner -	76	Dropping his candle into powder whilst preparing a straw for firing a shot.	–	–	–	1	–

LIST OF MINES, PRODUCE, &c. under the METALLIFEROUS MINES REGULATION ACT in the portion of MR. DICKINSON'S DISTRICT, consisting of CHESHIRE, SUSSEX, and NORTH and EAST LANCASHIRE, excepting the Amounderness or detached part of North Lancashire.

Owners or Company.	Mine.	Where situated.	Mining Produce.	Tons.	Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
CHESHIRE.										
Alderley Edge Mining Co., Ld.	Alderley Edge Copper.	Alderley Edge, near Manchester.	Copper precipitate.	—	–	–	—	—	—	Abandoned. Record Plan sent to Home Office 1878.
Falk, H. E., Meadowbank Salt Works, Winsford, Cheshire.	Meadowbank Rock Salt.	Winsford - -	Rock Salt	19,763	1	1	—	—	Iron tools, G.R. 2, 1873; cover overhead, G.R. 11, 1873.	—
Fletcher and Rigby -	Marston Old Rock Salt.	Marston, Northwich	Ditto -	19,806	–	–	—	—	Iron tools, G.R. 2, 1873; guides and signals, G.R. 10, 1873; cover overhead, G.R. 11, 1873.	—
Hayes, Wm. - -	Marston Hall Rock Salt.	Ditto - -	Ditto -	29,500	–	–	—	—	Iron tools, G.R. 2, 1873; cover overhead, G.R. 11, 1873.	—
Steenstrand, Wm. - -	Steenstrand's Rock Salt.	Wincham, Northwich.	Ditto -	25,800	–	–	Mr. R. Senior	—	Iron tools, G.R. 2, 1873; cover overhead, G.R. 11, 1873.	—
Thompson, John, and Son, Witton Street, Northwich - - -	Marston Pool Rock Salt.	Marston, Northwich	Ditto -	1,725	–	–	—	—	Iron tools, G.R. 2, 1873; guides and signals, G.R. 10, 1873; cover overhead, G.R. 11, 1873.	—
	Penny's Lane Rock Salt.	Witton, Northwich	Ditto -	—	–	–	—	—	Iron tools, G.R. 2, 1873; guides and signals, G.R. 10, 1874; cover overhead, G.R. 11, 1874.	—
	Platts Hill Rock Salt.	Wincham, Northwich.	Ditto -	15,459	–	–	—	—	Iron tools, G.R. 2, 1873; guides and signals, G.R. 10, 1873; cover overhead, G.R. 11, 1873.	—
Verdin, Joseph, and Sons, Salt Works, Winsford, Cheshire - - -	Adelaide Rock Salt	Marston, Northwich	Ditto -	32,714	–	–	—	—	Iron tools, G.R. 2, 1873; signals, G.R. 10, 1873; cover overhead, G.R. 11, 1873.	—
	Baron's Quay Rock Salt.	Witton, Northwich	Ditto -	8,071	–	–	—	—	Iron tools, G.R. 2, 1873; guides and signals, G.R. 10, 1873; cover overhead, G.R. 11, 1873.	—
		Total Rock Salt - -		152,829						

Owners or Company.	Mine.	Where situated.	Mining Produce.	Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
						SUSSEX.			
			Tons.						
Sub-Wealden Gypsum Co., Ld. (Charles C. Pratt, Secretary), Battle, Sussex.	Mountfield Gypsum	Near Battle -	Gypsum 2,688	–	–	Wm. Finlay	8th Nov. 1877	——	The Special Rules for this mine have the following signals instead of those contained in the Report of 1874, established for other metalliferous mines of the district:— 1 stroke to stop. 2 strokes to lower. 3 „ „ wind up. 4 „ „ „ when men are coming up. 5 „ „ lower when men are going down.
						NORTH AND EAST LANCASHIRE, exclusive of the detached part of NORTH LANCASHIRE.			
Brocklehurst, Wm., and Co. (Wm. Mellor, Agent), Ardwick Lime Works, Manchester.	Ardwick Limestone	Ardwick, Manchester.	Limestone —	—	—	—	—	Guides, G.R. 10, with provision as to steadying when persons ride, 1879. Signal *down*, G.R. 10, 1879; cover overhead, G.R. 11, 1879.	——
Butterworth and Brooks, Sunny Side, Rawtenstall.	Chapel Hill -	—	— —	—	—	—	—	——	——
	Pinner - - -	—	— —	—	—	—	—	——	——
Cunliffe, Richd., Scout Quarries, Newchurch, near Manchester -	Deansgreave Flag and Slate.	Near Bacup -	Flag Stone and Slate. —	—	—	—	—	——	——
	Scout Flag and Slate	Near Newchurch -	Ditto - —	—	—	—	—	——	——
	Bent Flag and Slate	Sough, Over Darwen.	Ditto - —	—	—	—	—	Guides, G.R. 10, 1876; signals, G.R. 10, 1876; cover overhead, G.R. 11, 1876.	——
Entwisle, James Pickup, Sough, Darwen -	Old Flag and Slate	Ditto Ditto	Ditto - —	—	—	—	—	Guides, G.R. 10, 1874 -	——
	Pole Lane Flag and Slate.	Ditto Ditto	Ditto - —	—	—	—	—	Guides, G.R. 10, 1874 -	——

List of Mines, Produce, &c.—*continued.*

Owners or Company.	Mine.	Where situated.	Mining Produce.		Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
				Tons.						
North and East Lancashire, &c.—*continued.*										
Entwisle, Robt. S., and Wm., Sough, Darwen.	Sough Flag and Slate.	Over Darwen -	Flag Stone and Slate.	—	–	–	—	—	Guides, G.R. 10, 1874 -	—
Graham, Rev. P., Turncroft, Darwen.	Turncroft Flag and Slate.	Ditto -	Ditto -	—	–	–	—	—	—	—
Grindrod, John, and Co., Limited.	Blue Hole Flag and Slate.	Tong End, Whitworth.	Ditto -	—	–	–	—	—	—	—
Heys, Henry, Brandwood Moor Quarries, Stacksteads, Manchester.	Tong End Pasture Flag and Slate.	Ditto Ditto	Ditto -	—	–	–	—	—	—	—
			Ditto -	—	–	–	—	—	—	—
Jackson, Robt., and Sons, Cock Hall, Facit, Rochdale.	Schofield Hey Flag and Slate.	Schofield Rough, Whitworth.								
Jackson, Saml., Exors. of, Cowm Delf, Whitworth, Rochdale.	Moor Bottom Flag and Slate.	Cowm, Whitworth	Ditto -	—	–	–	—	—	—	—
Law, Isaac - -	Shawforth -	Near Rochdale -	Ditto -	—	–	–	—	—	—	—
Parkinson, George, and Son, Masons, Newchurch.	Park House -	Newchurch -	Ditto -	—	–	–	—	—	—	—
Perkins, Wm., and Baxendall, Adlington.	New Trial Stone -	Heath Charnock, Chorley.	Ditto -	—	–	–	—	—	—	Discontinued.
Pickup, Lloyd, and Milward, Marsh House, Darwen.	Lower Marsh House Flag and Slate.	Over Darwen -	Ditto -	—	–	–	—	—	—	—
Sanderson, Mr. James -	Old Pits Flag and Slate.	Tong End, Whitworth.	Ditto -	—	–	–	—	—	—	—
Siddall, Richd., junr., Brandwood Quarries, Waterfoot, near Manchester.	Back Cowm Flag and Slate.	Whitworth -	Ditto -	—	–	–	—	—	—	—
Taylor and Holden, Millwright's Arms, Darwen.	Dandy Row Flag and Slate.	Eccleshill - -	Ditto -	—	–	–	—	—	—	—
Turner, Mr. John -	Moss Flag and Slate	Shawforth Moor, Whitworth.	Ditto -	—	–	–	—	—	—	—

CHAPTER 3.

Ireland.

The mines of Ireland now consist of 31 under the Coal Mines Regulation Act, and 36 under the Metalliferons Mines Regulation Acts. The annual returns made to me for the year 1878 show that the number of persons ordinarily employed in and about the collieries was 1,222, and in and about the metalliferous mines 1,519. Of the persons employed at the collieries 75 were in the province of Connaught, 663 in Leinster, 267 in Munster, and 217 in Ulster. Of those at the metalliferous mines, 14 were in Connaught, 489 in Leinster, 552 in Munster, and 464 in Ulster. The numbers, as compared with those of the preceding year, are a diminution of 26 persons at the collieries, and 526 at the metalliferous mines. At the collieries there is a diminution of 3 in Connaught, 50 in Leinster, 10 in Munster, but an increase of 37 in Ulster. At the metalliferous mines there is an increase of 1 in Connaught; but a diminution of 95 in Leinster, 358 in Munster, and 74 in Ulster. The great diminution in the number of persons employed at the metalliferous mines is chiefly attributable to the depressed state of the copper and iron pyrites trade.

Of the 1,222 persons employed in and about the collieries in 1878, 841 were below ground, and 381 above ground. Of those below ground all were male persons, 29 being between 13 and 16 years of age, and 812 above 16. Of those above ground, 8 were males between 13 and 16, and 1 female and 372 males above 16.

Of the 1,519 persons employed in and about the metalliferous mines in 1878, 812 were below ground and 707 above ground. Of those below ground all were male persons, 15 being between 13 and 16 years of age and 797 above 16. Of the 707 above ground, the ages were, 29 males and 5 females between 8 and 13, 107 males and 46 females between 13 and 18, 32 females and 488 males above 18.

The produce of coal in 1878 shown by the returns made to me under the Act was 122,051 tons, which is a decrease of 18,130 tons as compared with the preceding year. Connaught produced 6,456 tons, Leinster 74,474, Munster 28,714, and Ulster 12,407. The decrease is 21 tons in Connaught, 13,621 in Leinster, 1,497 in Munster, and 2,991 in Ulster. Ulster also produced 3,808 tons of fire-clay, exclusive of what was produced by open-cast work, which is an increase of 1,768 tons as compared with the preceding year. The get per person employed in and about the coal and fire-clay mines averages 103 tons, which is a decrease of 10 tons per person as compared with the preceding year. The get per person in the Lancashire portion of the district, where many of the collieries are much larger and most of the seams of coal much thicker, was 292 tons per person in 1878.

At the metalliferous mines the produce of minerals dressed, and of undressed minerals, sold, treated, or used was :—

			Statute Tons.
Barytes,	Province of	Munster	8,792½
Beauxite (Silicate of Alumina),	„	Ulster	3,426
Blue Stone (Zinc, &c.),	„	Leinster	178
Copper Ore,	„	Munster	1,956
Copper Precipitate,	„	Leinster	70
Gold, 5 oz. 3 dwt. 17 gr.,	„	Ditto.	
Gold Ore, 2 qrs. 26½ lbs.	„	Ditto.	
Iron Ore,	„	Ditto 1,100	137,250¼
	„	Ulster 136,150¼	
Iron Pyrites,	„	Leinster	13,723
Lead Ore,	„	Ditto 1,525	1,555
	„	Munster 30	
Manganese Ore,	„	Munster	50
Ochre,	„	Leinster	100
Rock Salt,	„	Ulster	30,101
Slate and Slabs, exclusive of those got in quarries,	„	Leinster 200	2,700
	„	Munster 2,500	
Steatite, or Soapstone,	„	Ulster	57

This produce of the metalliferous mines is an increase of barytes, beauxite, blue stone, (last year's entry being as zinc ore,) gold, and rock salt; but a decrease of copper ore, copper precipitate, iron ore, iron pyrites, lead ore, ochre, slate (from mines), and steatite; manganese being the same as in the preceding year. The produce of the respective mines will be found in the list at the end of this chapter.

At the collieries two fatal accidents with the loss of one life by each happened. Also five accidents attended with serious personal injury. The fatal accidents were both at the Slievardagh Collieries, county Tipperary. The first was on 22nd January, at Coalbrook Colliery, to a miner named John Hacket, aged about 50 years, by roof falling where he was getting coal; and the second was on the 2nd November, at Foilacamin Colliery, to a roadmaker named Luke Wall, aged about 40 years, by a stone falling from a slip where he was assisting to make a road in the mine. The non-fatal accidents were four by falls of ground, and one by scalding in a steam boiler. Those by falls of ground were, first by coal falling, on being wedged after the firing of a shot; second, by roof falling were worked coal was being cleared out; third, by roofstone falling when being dressed; and fourth, by stone falling from the roof at a slip. The scalding in the boiler was in consequence of the steam valve separating another boiler not being quite closed. The fatal accidents at the collieries have been: in 1875, 3 accidents with 4 deaths; in 1876, none; in 1877, 1 accident with 1 death; and in 1878, 2 accidents with 2 deaths.

At the metalliferous mines two fatal accidents happened with the loss of one life by each. Also two non-fatal accidents attended with serious personal injury. The fatal accidents were both at Cronebane Mine, Ovoca, county Wicklow; the first being on 20th March to a miner named John Byrne, aged 42 years, by stone falling from the roof, were he and another miner were taking out a "middling," or stump pillar, in the lode; the second was on 18th November to a timberman named Patrick Mooney, aged 22, by ground falling where he was making an airway or sloping shaft in the lode. Both of these accidents happened near old workings were the ground was crushed. The non-fatal accidents were on the 22nd April, at Muckross Head Barytes Mine, to an assistant banksman named Jeremiah Callaghan, aged 16 years, who pushed a tub into the shaft (apparently thinking the cage was there) and fell down after it, falling 68 feet on to the cage at the bottom. The other was on the 28th October at the Barrow Mines, Cookstown, to an engineman who was carried round by a fly-wheel in getting it off the centre. The fatal accidents at the metalliferous mines since the commencement of the Act in Ireland have been: in 1873, 7 accidents with 7 deaths; in 1874, 1 accident with 1 death; in 1875, 6 accidents with 6 deaths; in 1876, 1 accident with 1 death; in 1877, 1 accident with 1 death; and in 1878, 2 accidents with 2 deaths.

The regulations under the Acts generally have been fairly observed, and it has not been found requisite to report any contravention to the Secretary of State.

The mines of Ireland, in proportion to the number of persons employed, now constitute about one twelfth part of the district with which they are associated. The Irish portion was visited on 11 separate occasions, which occupied 74 days, besides seven nights in travelling. Of these visits, nine occupying 54 days and four nights were made by myself, two occupying 20 days and three nights by Mr. Martin, the assistant inspector. Exclusive of general business at mining offices, 102 visits of inspection were made either to mines or regarding the fencing of abandoned shafts, 56 of the visits, of which 16 were underground, were made by myself, and 46, of which 11 were underground, by the assistant inspector. One adjourned inquest also was attended by me.

The precipitation of copper from mineral water, which until recently has only been in operation above ground at certain mines, has during last year been introduced below ground in the Cronebane Mine, county Wicklow. It might, however, have proved a very serious affair, as but for the watchfulness of those acting in the management, who noticed the flame of the candles lengthening, the gas emitted might have occasioned a very destructive explosion.

Mr. Henry Robinson of Ballygahan Mine, county Wicklow, writes to me as follows on the future of the metalliferous mines, with special reference to the iron pyrites mines of Ireland. The information contained in chapter three of last year's report would induce the belief that if more capital was introduced into this country, and its expenditure placed in proper hands, a better and more industrious spirit might be promoted among us, and mining become a reality rather than a speculation. With respect to our prospects here (Ovoca) they are very shadowy indeed. Our staple trade, the iron pyrites mines, may be said to have ceased; the Spanish mines having beaten us out of the market, and so great are their resources that we can never hope to resume the position we held some years since. At Rio Tinto Mines it appears the daily out-put is about 3,500 tons of rich iron pyrites, containing besides sulphur two per cent. of copper, and their reserves are said to be 60 million tons. With such a concern it is hopeless for us to contend.

Annexed is a copy of a compilation made some years ago by Mr. Hunt of the sales of copper ore at Swansea from Irish mines from 1806 to 1847 inclusive.

A list of the present mines, produce &c., will be found at the end of this chapter; and general matters relating to the whole district will be found in chapter one.

Sales of Copper Ore at Swansea from Irish Mines.

—	1806.	1807.	1808.	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.	1817.	1818.	1819.	1820.	1821.	1822.	1823.	1824.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.
Sundries	–	–	–	–	10	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	4	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lackamore	40	76	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	17	–	–	–	–	–	–	–	–	19	143	407	510	648	411	260	166	119	124	69
Ross Island	22	674	326	630	573	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	211	762	560	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Loughshinney	–	60	31	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	18	–	–	–
Cronebane	–	–	534	–	–	–	–	–	–	–	–	–	–	–	–	–	–	302	1,155	1,544	1,335	1,514	1,280	1,079	1,700	2,473	2,265	1,266	2,181	2,880	3,112	2,255	1,180	1,253	1,671	228	405	759	819	1,635	2,235	1,241
Tipperary	–	–	–	–	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	19	–	–	–	–	–	–	–	–	–
Malagow	–	–	–	–	–	68	75	38	81	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Crow Island	–	–	–	–	–	–	45	41	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Allihies	–	–	–	–	–	–	–	134	300	631	673	–	148	1,218	1,862	1,945	1,501	2,577	2,350	2,966	1,809	2,613	2,693	2,040	2,723	3,177	5,267	5,787	6,819	7,288	5,993	4,835	4,964	5,460	4,808	4,777	1,278	–	–	–	–	–
Kenmare	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3,613	4,446	4,924	5,835	5,758	5,807
Ballycummisk	–	–	–	–	–	–	–	–	16	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Horse Island	–	–	–	–	–	–	–	–	5	–	–	–	–	–	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Burnt Irish	–	–	–	–	–	–	–	–	27	24	–	–	95	167	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Galway	–	–	–	–	–	–	–	–	–	–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ballydehob	–	–	–	–	–	–	–	–	–	–	–	–	106	146	288	38	20	–	–	–	8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cappagh	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30	57	33	–	–	–	60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Wicklow	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	352	400	–	–	–	937	1,889	571	342	99	119	–	–	–	–	–	8	–	–	–	–	–	–	–	–	–	–
Ballymurtagh	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	17	302	513	525	486	520	–	–	–	–	388	1,582	3,389	5,500	4,437	7,085	5,280	6,562	3,269	–	377	1,385	3,841	3,063	2,718	872
Nanmor	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	23	35	5	6	5	–	7	–	–	–	–	–	–	–	–	–	–	–	–	–	12	–	–	–	–
Conham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	42	216	19	20	109	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tigroney	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	27	202	251	526	1,024	1,279	1,633	1,606	1,617	1,339	1,002	1,334	1,666	1,529	1,800	1,662	1,718	1,346	273	279	401	353	657	644	422
Gandore	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Knockmahon	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	17	58	170	613	2,255	2,189	1,928	998	994	2,204	3,316	5,068	7,034	7,372	7,875	7,713	8,158	9,111	8,362	7,214	5,721	4,958
Audley	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	387	203	359	367	152	11	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Knockmalaur	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	111	123	14	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
Kilduanne	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	59	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	75	–	81
Ballygahan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	57	59	108	–	–	48	363	428	310	219	1,210	503	198	–	105	28	34	42	56	33
Connorree	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	82	610	2,200	2,076	2,129	967	639	338	150	82	256	641	624	586	–	–	–
West Cork	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	81	187	58	–	–	–	–	–	–	–	–	–	–
Bawneshall	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	22	–	25	–	–	–	–	–	–	–
Finral	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	40	27	–	–	–	–	–	–
Coshem	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	197	264	308	560	603	125	26	19
Kenmare Ardtully	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	77	271	68	31	66	120	144	–
Schull	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	35	–	84	–	–	–	–
Belfast	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	33	44	–	–	–
Dreenatra	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	61	–	–	–	–
Dhurode	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	97	102	30	–
Roaring Water	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	14	–	–	–
Dublin Slag	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	60	66	–	–
Shionagree	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	21	–	–	–
Hollyford	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	77	841

MINES CLASSED UNDER THE COAL MINES REGULATION ACT.

LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in the portion of Mr. DICKINSON'S DISTRICT, consisting of IRELAND, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878.													
Jan. 22	1	Coalbrook -	Slievardagh, co. Tipperary.	Mining Company of Ireland, Limited.	John Hacket -	Coal miner	50	Roof falling where he and three others were getting coal.	–	1	–	–	–
Oct. 5	2	Foilacamin -	Ditto -	Ditto - -	Luke Wall -	Roadman -	40	Stone falling from a slip where he was assisting to make a road.	–	1	–	–	–
								Total - -	–	2	–	–	–

LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in the portion of Mr. DICKINSON'S DISTRICT, consisting of IRELAND, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878. Mar. 20	1	Cronebane -	Ovoca, co. Wicklow -	Associated Irish Mine Co.	John Byrne -	Miner -	42	Stone falling from the roof as he was boring a hole in the roof of the intermediate level west of Copse Shaft. He and another miner were taking out a middling or stump that had been left in the lode, and the ground was on the move.	–	1	–	–	–
Nov. 18	2	Ditto -	Ditto -	Ditto - -	Patrick Mooney -	Timberman	22	Stone and timbering falling as he was making a sloping cut for air through broken ground.	–	1	–	–	–
								Total - -	–	2	–	–	–

LIST of MINES, MANAGERS, &c. under the COAL MINES REGULATION ACT in the portion of MR. DICKINSON'S DISTRICT consisting of IRELAND, 1878.

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
CONNAUGHT:—COUNTIES LEITRIM, ROSCOMMON, AND SLIGO (LOUGH ALLEN COALFIELD).								
Lough Allen Clay Works, Ld., Spencer Harbour Collieries, Drumkeerin, Carrick-on-Shannon.	Seltanaskeagh (Co. Leitrim).	Drumkeerin - -	–	–	James Lyons	4th April 1874 -	Boys, sec. 5, 1876; weighing, sec. 17, 1876.	——
Gallaher, Patrick, Aughlin, Ballinamon, Carrick-on-Shannon.	Ballynameltogue (Co. Leitrim).	Ballinamore - -	–	–	—	5th Feb. 1878 -	——	Abandoned, trial only.
McGreevy, John - -	Greagnageera (Co. Roscommon).	Ballyfarnon, Carrick-on-Shannon.	–	–	—	25th Feb. 1874 -	——	Discontinued.
McPartland, Peter - -	Seltenaveeny (Co. Roscommon).	Lough Allen, Carrick-on-Shannon.	–	–	—	3rd July 1876 -	Weighing, sec. 17, 1876 -	——
O'Rourke, Patrick - -	Geevagh (Co. Sligo)	Ballyfarnon, Carrick-on-Shannon.	–	–	—	13th March 1875	Weighing, sec. 17, 1875 -	——
Rynn, Patrick, & Co. -	Knockateeane (Co. Leitrim).	Lough Allen, Carrick-on-Shannon.	–	–	—	3rd Jan. 1877 -	——	——
Walsh, Patrick, Aughabehy, Ballyfarnon.	Gubberadda (Co. Roscommon).	Ballyfarnon, Carrick-on-Shannon.	–	–	—	1875	Weighing, sec. 17, 1875 -	——
LEINSTER:—KILKENNY AND QUEEN'S COUNTIES (LEINSTER COALFIELD).								
Bradley, Arthur and Thomas Keer.	Old Lordship (Co. Kilkenny).	Coolbawn, Castlecomer.	–	–	—	15th Dec. 1876 -	——	S. Rules travelled from Keer's, Moneen Roe, &c., pit.
Bradley, John, Moneenroe, Castlecomer.	Rockbridge (Ditto) -	Ditto - -	–	–	John Bradley	4th March 1874	——	Abandoned. Record Plan sent to Home Office, 1878.
Close, Henry and Mrs. Eliza Bradley.	East Skehana (Ditto)	Castlecomer -	–	–	—	13th March 1874	Saturday half holiday, sec. 12, 1874; weighing, sec. 17, 1874.	Discontinued.
Comerford, Lawrence, care of B. B. Edge, Crettyard, Carlow.	Doonane Banks -	Doonane, Crettyard -	–	–	—	31st Jan. 1875 -	Saturday half holiday, sec. 12, 1874.	S. Rules travelled from his Clogh old pits.
Comerford, Thomas, Coolgreany, Kilkenny.	Reevanagh (Ditto) -	Tiscoffin - -	–	–	—	17th July 1874 -	Saturday half holiday, sec. 12, 1874; weighing, sec. 17, 1874; cover over head, G.R. 20, 1874.	Discontinued.

List of Coal Mines, Managers, &c., in Ireland, 1878—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
KILKENNY AND QUEEN'S COUNTIES (Leinster Coalfield)—*continued.*								
Dobbs, Joseph, Coolbawn, Castlecomer.	Jarrow (Co. Kilkenny.)	Cloneen - -	–	–	Alexander Mc Luckie.	4th Mar. 1874	Saturday half holiday, sec. 12, 1874.	Record Plan of Nos. 1 and 2 Pits sent to Home Office 1875.
	Rock Bush (Ditto) -	Coolbawn - -	–	–	Wm. Wilson -		Saturday half holiday, sec. 12, 1874; cover over head, G.R. 20, 1876.	—
	Rock Wood (Ditto) -	Ditto - -	–	–	—		Saturday half holiday, sec. 12, 1874; cover over head, G.R. 20, 1876.	Discontinued.
Edge, Benj. Booker, Clonbrock House, Crettyard, Carlow.	Hollypark (Queen's Co.)	Crettyard - -	–	–	James Donnelly	4th April 1874 -	Saturday half holiday, sec. 12, 1874; weighing, sec. 17, 1873.	—
Edge, Wm. - -	Towlerton (Ditto) -	Ballickmoyler, Carlow.	–	–	Wm. J. Edge	7th Sept. 1874 -	Saturday half holiday, sec. 12, 1874.	—
Hall and Dobbs, Monteen Colliery, Crettyard, Carlow.	Monteen (Co. Kilkenny).	Castlecomer - -	–	–	Thos. Ryan -	13th March 1874	Saturday half holiday, sec. 12, 1874.	—
Hosey, Mrs. L. - -	Bilboa (Queen's Co.)	Milford, Carlow -	–	–	—	5th May 1876 -	Boys, sec. 5, 1876.	—
Lawlor, Mrs. - -	Boundary - -	Cloneen, Crettyard, Carlow.	–	–	—	—	—	—
Leinster Colliery Co., Ld., Ballylinan, Athy. (4, College Street, Dublin).	Modubeagh (Queen's Co.)	Wolfhill - -	–	–	James Hawe -	29th April 1874	Saturday half holiday, sec. 12, 1874; weighing, sec. 17, 1874.	Record Plan of the Chancery Pit workings sent to the Home Office 1875.
Robson, Grace, & Co., Clogh Colliery, Castlecomer.	Brian Clogh (Co. Kilkenny).	Cloneen - -	–	–	Richard Sutcliffe.	17th Aug. 1874	Saturday half holiday, sec. 12, 1874.	—
Rowe, Geo. - - -	Ardough (Queen's Co.)	Milford, Carlow -	–	–	—	29th March 1875	Saturday half holiday, sec. 12, 1874.	Discontinued.
Shortall, Michl. - -	Skehana (Ditto) -	Castlecomer - -	–	–	John Harding	13th March 1874	Saturday half holiday, sec. 12, 1874; weighing, sec. 17, 1874.	—
Shortall, Patrick - -	Rock Hill (Ditto) -	Coolbawn, Castlecomer.	–	–	—	4th March 1874	—	—
Smith, William - -	Trial - -	Clonbrock, Crettyard, Carlow.	–	–	—	—	—	—

List of Coal Mines, Managers, &c., in Ireland, 1878—*continued*.

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
MUNSTER:—COUNTIES TIPPERARY AND CORK.								
Mining Co. of Ireland, Limited, Slievardagh Collieries, New Birmingham, Thurles. (Wm. Harold, Secretary, 30, Lower Ormond Quay, Dublin; J. H. Lanphier, Agent, Slievardagh).	Coalbrook and Bolintlea.	Slievardagh, Tipperary.	1	1	John McEvoy	13th March 1874.	Weighing, sec. 17, 1874 -	—
	Earlshill and Ballynastic.	Ditto - -	–	–	Wm. Morris -		Weighing, sec. 17, 1874 -	—
	Foilacamin and Knockanglass.	Ditto - -	1	1	Patk. E. Hore		Weighing, sec. 17, 1874 -	—
	Venture Fair - -	Ditto - -	–	–	—		Weighing, sec., 17, 1874; cover over head, G.R. 20, 1875.	S. Rules travelled to this pit from the others.
	Lisnacon - -	Dromagh, Banteer, Co. Cork.	–	–	—		Weighing, sec. 17, 1874 -	Abandoned. Record Plan sent to Home Office 1878.
ULSTER:—COUNTIES ANTRIM AND TYRONE.								
Cullen, Patk., Edw. Hughes, and Thos. Millar.	Brackaville - -	Coal Island, Dungannon.	–	–	—	—	—	—
Devlin, Daniel - -	Ulster Fire-clay -	Ditto - -	–	–	—	24th Dec. 1874 -	—	—
Dungannon Mining Co., Ld.	Curran Sinking Pit -	Edendork, Dungannon	–	–	Maynes Campbell.	—	—	Formerly Tyrone Coal Mining Co.
	Drumglass - -	Ditto - -	–	–	Ditto	9th April 1874 -	—	Discontinued.
Fisher, John and Patk., and Jos. Hughes.	Brackaville - -	Coal Island, Dungannon.	–	–	—	8th Oct. 1877 -	—	—
Godden and McDonald -	Ballycastle Coal and Ironstone (Co. Antrim).	Ballycastle, Ballymoney.	–	–	John James -	26th Jan. 1875 -	—	—
Hughes, John, Jas. Tierney, and Frank McClusky.	Derry - - -	Coal Island, Dungannon.	–	–	—	—	—	Discontinued.
McClernon, Henry and John, and John Kee.	Annagher - -	Ditto - -	–	–	—	—	—	—
McKenna, Thomas, and Arthur Donnelly.	Brackaville - -	Ditto - -	–	–	—	—	—	Discontinued.
McNally, John and Chas., and Wm. Donnelly.	Annagher - -	Ditto - -	–	–	—	—	—	Discontinued.

List of Coal Mines, Managers, &c., in Ireland, 1878—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
		COUNTIES ANTRIM AND TYRONE—*continued.*						
O'Neill, Patk., & Co. -	Coal Island - -	Coal Island, Dungannon.	–	–	—	24th Dec. 1874 -	——	——
Tyrone Coal Mining Co., Edendork, Dungannon (9, Victoria Chambers, Belfast.)	Congo - -	Edendork, Dungannon	–	–	Maynes Campbell.	9th April 1874 -	——	S. Rules travelled to this pit from Drumglass.
	Drumglass - -	Ditto - -	–	–	—	9th April 1874 -	——	Abandoned 1875. Record Plan sent to Home Office 1875.

LIST OF MINES, PRODUCE, &c. classed under the Metalliferous Mines Regulation Act in the portion of Mr. DICKINSON'S DISTRICT consisting of IRELAND, 1878.

Owner or Company.	Mine.	Where situated.	Mining Produce sold, treated, or used.	Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
			CONNAUGHT.						
Errishberg Mining Co., Ld. (M. G. Painter.)	Errishberg -	Roundstone, Galway, Co. Galway.	—	-	-	—	—	—	—
			LEINSTER.						
Acheson, Fred., Wooden Bridge, Ovoca.	Ballinvally Gold -	Wooden Bridge, Co. Wicklow.	Gold 5 oz. 3 dwt. 17 gr. - Gold Ore 2 qrs. 26½ lbs. -	-	-	—	—	—	—
Annaly, Rt. Hon. Lord, Woodlands, Clonsilla, near Dublin.	Annaly Lead -	Clonsilla, Co. Dublin.	—	-	-	—	—	—	—
Associated Irish Mine Co. Cronebane Mine, Ovoca (Williams and Co., Perranarworthal, Cornwall) -	Cronebane -	Ovoca, Co. Wicklow.	Tons. Copper Precipitate 15½ Iron Pyrites 3,788¼	2	2	Mr. George Oates.	—	—	—
Clonwilliam Quarrying and School Slate Manufacturing Co., Ld. (Astrup Cariss, Liquidator, 40, Castle Street, Liverpool.)	Clonwilliam Slate -	Wooden Bridge, Co. Wicklow.	Slate - 200	-	-	Mr. Owen Pryddarch.	—	—	—
Connorree Mining Co., (Dubētat, Wm. G., Foster Place, Dublin) - -	Connorree -	Ovoca, Co. Wicklow.	Blue Stone, Zinc Ore, &c. 178 Ochre - 100	-	-	—	—	—	Record Plan sent to Home Office 1876 by former owners.
Hodgson, Henry, Reps. of the late, Ballygahan Mines, Ovoca - - -	Ballygahan -	Ditto - -	Copper Precipitate 12½ Iron Pyrites 710	-	-	Henry Robinson.	—	—	—
Mining Co. of Ireland, Ld., Luganure Mines, Seven Churches, Rathdrum.	Foxrock - -	Seven Churches, Co. Wicklow.	Lead Ore 1,525	-	-	Mr. James Mitchell.	20th May 1875.	—	—
	Glendalough -	Ditto - -							
	Ruplagh - -	Ditto - -							
O'Byrne, Wm. Richd., M.P., Cabinteely House, Co. Dublin - - -	Ballycapple -	Near Dundanstone, Wicklow, Co. Wicklow -	Iron Ore Ochre	-	-	—	—	—	Discontinued.

List of Mines, Produce, &c. classed under the Metalliferous Mines Regulation Act in Ireland, 1878—*continued.*

Owner or Company.	Mine.	Where situated.	Mining Produce sold, treated, or used.	Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
			Tons.						
Parnell, Charles S., M.P. -	Avondale - -	Rathdrum, Co. Wicklow.	—	-	-	—	—	—	Discontinued.
Wicklow Copper Mine Co., Ballymurtagh Mines, Ovoca (113, Grafton Street, Dublin) - -	Ballymurtagh -	Ovoca, Co. Wicklow.	Iron Ore - 1,100 Iron Pyrites 5,261	-	-	John Hodge -	7th August 1878.	—	——
Williams and Co., Perranarworthal, Cornwall, Tigroney Mine, Ovoca -	Tigroney - -	Ovoca, Co. Wicklow.	Copper Precipitate 42 Iron Pyrites 3,964	-	-	Mr. James Higgins.	—	—	——
			MUNSTER.						
Bantry Bay Barytes Co., Ld. (Edward Ashmead, Liquidator, Cornhill Chambers, 62 and 63, Cornhill, London), Kilmocapogue, Bantry.	Bantry Bay Barytes	Near Bantry, Co. Cork.	—	-	-	—	—	—	Discontinued.
Berehaven Mining Co., Ld. (R. Clog, Secretary, 4 and 5, Westmorland Street, Dublin), Allihies, Bantry.	Coom - -	Allihies, Co. Cork	Copper Ore 1,753½	-	-	Mr. R. R. Nancarrow.	—	—	Coom abandoned. Record Plan sent to Home Office 1875.
	Doneen - -	Ditto - -							Doneen abandoned. Record Plan sent to Home Office 1878.
	Mountain - -	Ditto - -							——
Carahan Silver Lead Mining Co., Quin, Co. Clare.	Carahan - -	Carahan, near Ennis, Co. Clare.	—	-	-	Mr. Richd. Rowse.	—	—	——
Cummins, Charles, 1, Foster Place, Dublin.	Shallee - -	Nenagh, Co. Tipperary.	Lead Ore - 30	-	-	—	—	—	Discontinued.
Duneen Bay Mineral Co., Ld., Clonakilty.	Muckruss Head Barytes.	Clonakilty, Co. Cork.	Barytes - 8,311	-	-	Mr. John Cardew.	16th December 1875.	—	——
Foster, R. C., and Arthur Willis - - - -	Glandore - -	Leap, Co. Cork -	Manganese Ore 50	-	-	—	—	—	——
General Mining Co. for Ireland, Ld. (L. Studdert and Thos. Baker, Liquidators), 58, Amiens Street, Dublin.	Silvermines -	Silvermines, Nenagh, Co. Tipperary.	—	-	-	—	—	—	Discontinued.

List of Mines, Produce, &c. classed under the Metalliferous Mines Regulation Act in Ireland, 1878—*continued*.

Owner or Company.	Mine.	Where situated.	Mining Produce sold, treated, or used.	Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
			Tons.						
Ballycummisk Mines, Ballydehob, Skibbereen.	Ballycummisk -	Schull, Co. Cork -	—	–	–	Mr. Edwd. Daniel.	—	—	Abandoned. Record Plan sent to Home Office 1878.
	Coosheen - -	Ditto - -	—	–	–		—	—	Ditto ditto.
Mining Co. of Ireland, Ld. (Wm. Harold, Secretary, Lower Ormond Quay, Dublin); Knockmahon Copper Mines, Bonmahon	Glen - -	Knockmahon, Co. Waterford.							
	North Tankardstown.	Ditto - -	Copper Ore 203	–	–	—	—	—	Abandoned. Record Plans sent to Home Office 1879.
	Tankardstown -	Ditto - -							
Oola Hills Silver Lead Mining Co., Ld., Oola, Tipperary.	Oola - -	Oola, Co. Tipperary	—	–	–	Mr. J. Phillips	—	—	Formerly Wm. Sunderland.
Scart Barytes Co., Bantry, Cork.	Scart Barytes -	Bantry, Co. Cork -	Barytes - 481½	–	–	Mr. J. Mitchell	—	—	——
Valentia Slate Slab Co., (Groom and Maynus), Valentia, Killarney (8, Old Jewry, London, E.C.)	Valentia - -	Island of Valentia, Co. Kerry.	Slate - 2,500	–	–	—	—	—	——
			ULSTER.						
Antrim Iron Ore Co., Ld. (Robert Browne, Secretary), 1, Victoria Chambers, Belfast.	Cargan - -	Glenravel, Ballymena, Co. Antrim.				Mr. C. H. Williams.	—	—	——
	Glenarm -	Near Glenarm, Co. Antrim.	Iron Ore 48,047	–	–	Ditto -	24th July 1875.	—	——
	Rathkenny -	Near Ballymena, Co. Antrim -				Ditto	15th April 1876.	—	——
Barrow Hæmatite Steel Co., Ld.	Barrow - -	Near Cookstown, Co. Tyrone.	—	–	–	—	13th August 1877.	—	——
Belfast Mining Co., Ld. (J. A. Cochrane, Secretary), 5, Victoria Chambers, Belfast.	French Park -	Duncrue, Carrickfergus, Co. Antrim.	Rock Salt 12,707	–	–	—	7th April 1875.	Cover over head, G. R. 11, 1878.	——
Chambers, Charles, 3, Westminster Chambers, Victoria Street, London.	Evishacrow Iron Ore.	Glenravel, Co. Antrim.	—	–	–	Mr. John Robertson.	—	—	——

List of Mines, Produce, &c. classed under the Metalliferous Mines Regulation Act in Ireland 1878—*continued.*

Owner or Company.	Mine.	Where situated.	Mining Produce sold, treated, or used.	Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
			Tons.						
County Down Iron Ore Co. (James C. Greer, Annadale, Belfast.)	Deehommed Iron Ore.	Near Ballynahinch, Co. Down.	—	–	–	—	—	—	—
Crommelin Iron Ore Co., 22, Victoria Chambers, Belfast.	Newton Crommelin	Glenravel, Ballymena, Co. Antrim.	Iron Ore 32,142	–	–	—	24th April 1875.	—	—
Dalway, M. R., M.P., Salt Works, Carrickfergus.	Maiden Mount -	Duncrue, Carrickfergus, Co. Antrim.	Rock Salt 17,394	–	–	Mr. J. S. Hodkinson.	—	Iron Tools, G. R. 2, 1873. Cover over head, G. R. 11, 1873.	—
Duckworth, Executors of John, Nursery Works, Radcliffe, Manchester.	Garton - -	Carratrasna, near Letterkenny, Co. Donegal.	Steatite (Soap Stone) 57	–	–	—	—	—	—
Duneany Mining Co. (Wm. Boaden, and Co., 34, Ramsden Street, Barrow-in-Furness.)	Duneany - -	Near Glarryford, Co. Antrim.	Iron Ore 7,340	–	–	—	—	—	—
Fisher, John, and Co., Glenravel Iron Ore Mines, near Ballymena.	Glenravel - -	Slieveniah, Glenravel, Co. Antrim.	Iron Ore 16,770¼	–	–	Mr. — O'Raw	—	—	—
Glenariff Iron Ore and Harbour Co., Ld. (John Ham, Secretary), 36, Walbrook, London.	Cloghcor - -	Parkmore, Ballymena, Co. Antrim.	Iron Ore 11,230	–	–	—	—	—	—
Irish Hill Iron Ore Mining Co., Carrickfergus.	Irish Hill and Straid	Ballynure, Co. Antrim.	Beauxite (Silicate of Alumina.) 3,426	–	–	Alexander Sutherland.	7th April 1875.	—	—
Knockboy Mining Co., Broughshane, Ballymena.	Knockboy Iron Ore	Broughshane, Co. Antrim.	—	–	–	Isaac Ross -	7th July 1875.	—	—
Larne Iron Mines - -	Agnews Hill and Shanes Hill Iron Ore.	Kilwaughter, Larne, Co. Antrim.	—	–	–	—	—	—	Discontinued.

List of Mines, Produce, &c. classed under the Metalliferous Mines Regulation Act in Ireland 1878—*continued.*

Owner or Company.	Mine.	Where situated.	Mining Produce sold, treated, or used.	Fatal Accidents.	Deaths.	Manager.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
			Tons.						
Mount Cashel Iron Ore Co., Ld., 9, Victoria Chambers, Belfast (86, King Street, Manchester).	Evishnably and Coreen.	Glenravel, Ballymena, Co. Antrim.	Iron Ore 9,596	–	–	Silas Evans -	—	—	Discontinued. Record Plan of Coreen Mine sent to Home Office 1876.
Parkmore Iron Ore Co., Cushendall, Larne, (26, Sandhills Lane, Whitehaven.)	Parkmore Iron Ore	Near Ballymena, Co. Antrim.	—	–	–	Mr. Alex. Gillespie.	—	—	Discontinued.
Richie, Francis, and Sons, Belfast - - -	Ballypallady Iron Ore Quarry.	Templepatrick, Co. Antrim.	Iron Ore (Opencust)	–	–	—	—	—	—
	Island Magee Lithomarge Quarry.	Larne, Co. Antrim	Ditto (Opencust) 8,058						
	Moville Iron Ore Quarry.	Redcastle, Co. Donegal.	Ditto (Opencust)						
Scot, Fredk. B., 1, Great College Street, London.	Fair Town, Stranorlar.	Stranorlar, Co. Donegal.	—	–	–	—	—	—	Explanation: —
Townson, Benjn. - -	Ballylaggan Iron Ore.	Near Coleraine, Co. Antrim.	Iron Ore - 482	–	–	Mr. S. Simmons	—	—	—
	Orblereigh Iron Ore.	Portrush, Co. Antrim	Iron Ore 2,485	–	–	Ditto -	—	—	—

CHAPTER 4.

NORTH AND EAST LANCASHIRE.

Mines classed under the Coal Mines Act.

The returns made to me for this, the principal portion of the district, show that during the year 1878 the number of persons ordinarily employed in and about the mines was 29,789; and that 8,633,839 tons of coal, 76,840 tons of fire-clay, 41 tons of ironstone, 5,143 tons of shale for making alum, and 556 tons of copperas lumps, being a total of 8,716,419 tons of minerals produced. Also that 54 separate fatal accidents and 99 deaths happened to persons employed in and about the mines.

The ratio of casualties is one fatal accident in every 552 persons employed, and one death in every 301 persons employed. The ratio to the production of minerals is 161,415 tons per fatal accident, and 88,044 tons per death.

Of the 29,789 persons employed 24,726 were below ground and 5,063 above ground. These numbers, as compared with the previous year, are a total increase of 445; there being an increase of 572 below ground, but a diminution of 127 above ground. The respective numbers divided into the specified ages are given in the accompanying summaries.

The number of mines is 314. The average output of minerals is 292 tons per person employed in and about the mines.

The 54 fatal accidents with 99 deaths, consist of 3 accidents with 45 deaths by explosions of fire-damp, 32 accidents with 33 deaths by falls of sides and roof (one of these deaths being from an accident within a year and a day during the preceding year), 4 accidents with 4 deaths in shafts, 6 accidents with 8 deaths by miscellaneous underground, and 9 accidents with 9 deaths above ground. The details of these accidents is given in the accompanying list.

The fatal explosions of fire-damp happened 12th March at Unity Brook Colliery, Kersley, with the loss of 43 lives. The same day at Heskin Hall Colliery, Heskin, with the loss of one life. 2nd April at Todmorden Moor Colliery, with the loss of one life.

The explosion in Unity Brook Colliery with the loss of 43 lives occurred in the cannel mine from an outburst of fire-damp which issued with the first break and fall of roof in the west workings, open lights were in use throughout the pit, safety lamps being only used for making examinations. The usual precaution of removing all open lights when a break or fall was taking place being omitted. The details with a plan of the mine are given at the end of this report.

The explosion in Heskin Hall Colliery with the loss of one life was to a coal miner who went with his lighted candle into some fire-damp which was fenced off.

The explosions in Todmorden Moor Colliery with the loss of life to the manager was in a mine where fire-damp had not been found for eight years, and he was examining with a candle.

Other explosions of fire-damp not fatal, were 13 with slight burning to 15 persons, and two with severe burning to three persons. Of those with slight burning 12 happened where naked candles were in use, and in the other the gas apparently fired at the fireman's Davy lamp. Seven of them were slight flashes caused chiefly by a little gas accumulating between worked coal and the face of work; three by persons entering their places without first testing with a safety lamp; one by gas issuing suddenly with roof coal falling; and the other by a fall of roof driving gas to the candles. Of the two with severe burning to three persons, one of them in which two persons were burned was by a sudden outburst of gas from the roof where they ought to have been using safety lamps, but a collier's lamp was open; and in the other the gas fired at his candle in a cavity where he was packing above some arching. These non-fatal explosions of fire-damp happened January 9th, March 23rd and 27th, April 15th, 15th, May 7th, 8th, 15th, and 20th, July 1st, 12th, and 26th, September 24th, November 28th, and December 24th.

The only other non-fatal explosion of any kind by gas, explosive, or boiler, was a slight injury by a blown out shot.

The 32 fatal falls of sides and roof, with the loss of 33 lives, were: 9 accidents with the loss of 9 lives by falls from sides, and 23 accidents with the loss of 24 lives, one of the latter being from an accident within a year and a day during the preceding year.

Eighty-three other falls of side and roof, attended with personal injury, but non-fatal were reported as being attended with serious personal injury to 83 persons.

The four fatal shaft accidents with the loss of one life by each were: first, an underground engineman caught between the cage and the end of a guide rod as he was about to ascend

without having given the proper signal. Second, a surface engineman falling into the pit shaft, he having removed the fence for the purpose of taking out the water tank. Third, a sinker, by a stone falling from a horse tree where it had been blown by a shot, and was disturbed when the signal wire was pulled. Fourth, an onsetter or cager who was crushed by the cage into which he had stepped after giving the signal to go on.

There were also 15 non-fatal shaft accidents reported, which were attended by personal injury to 15 persons.

The six miscellaneous fatal accidents underground with eight deaths were: one to a fireman who, having descended a windless pit in the mine too soon after a shot had been fired became overpowered by powder smoke apparently mixed with a little after-damp from a blower, and fell out of the bucket whilst being hastily wound up. One with two deaths by an inundation of water consequent upon former workings being unexpectedly holed into. Two on inclined planes, one being by a tram on which the person was riding running away and getting off the rails; and the other by the prop to which a temporary pulley was fastened giving way. One, a pony priver, jammed by the tub on which he was riding getting off the rails; and one with the loss of two lives by scalding, caused by the joint of the man-hole at the bottom of the front of a steam boiler in the mine giving way and allowing water to escape out of the boiler until the top of a tube became bare and collapsed. The joint had been made that morning with a new india-rubber ring, and had been screwed up, but apparently the screwing had not been sufficiently followed up as the new ring softened with the heat when the steam rose. The head engineer, who had been called to assist, was one of the sufferers.

There were also 37 non-fatal miscellaneous accidents underground reported.

The nine fatal accidents above ground were each attended with the loss of one life, four of them were by machinery; namely, an engineman caught by pumping machinery underneath the floor of the engine-house; two coal-cleaners at the screens by tubs dropping out of the tipping apparatus, and one by a travelling crane, which had not been fastened down, becoming overbalanced as a railway waggon was being unloaded. The others were: two by falling off pit banks; two caught by railway waggons on colliery sidings, and one in an open cutting by a wooden stretcher becoming unloosened and falling upon him when another stretcher was being tightened up.

There were also 20 non-fatal miscellaneous accidents above ground reported.

The prosecutions instituted by me as inspector of mines for contraventions of the regulations during 1878 were as follows, and were conducted by Mr. Charles Holden, of the firm of Messrs. Holden and Holden, solicitors, Bolton.

14th March.—At the County Sessions Court, Bolton, the owner of certain land and minerals in Entwistle, for not securely fencing an old coal pit shaft, fined ten shillings and costs.

Same time and place, an adjoining landowner, for not fencing two old coal pit shafts, two pounds and costs.

19th August, at Leigh, the manager of the 6-feet mine, Nook Pit, Astley, for not providing adequate ventilation, fire-damp being accumulated above the timbering on a main level, ten pounds and costs.

Same time and place, the fireman for not making a careful examination and true report as to the fire-damp, one pound and costs.

18th September, at Bacup, the managing owner of New Line Colliery, for not providing adequate ventilation against black-damp or choke-damp, five pounds. Also for working boys over hours, five shillings and costs. Also for not keeping up the plan of the workings, half-a-crown and costs.

Same time and place, the owner of Intake Colliery, for not providing adequate ventilation against black-damp, five pounds and costs. Also for not having a true report made in a book as to the state of the ventilation, half-a-crown and costs. Also for allowing an iron blasting pricker to be in the mine, five shillings and costs.

Same time and place, the owner of Blue Ball Colliery, for not providing adequate ventilation against black-damp, five pounds and costs. Also for not paying the miners by the weight of mineral gotten, he having then no exemption, costs.

Same time and place, the underlooker of Blue Ball Colliery, for not withdrawing the men from dangerous black-damp, he being the person for the time being in charge of the mine, one pound and costs.

26th September, at Rochdale County Sessions Court, the owner of Nutwood Colliery, for not providing adequate ventilation against black-damp, five pounds and costs. Also for not producing any plan of the workings, five pounds and costs.

Same time and place, the underlooker of the same colliery, for not providing adequate ventilation, ten shillings and sixpence and costs.

Same time and place, the person for the time being in charge of the mine, for not with-

drawing the workpersons, five shillings and costs. Also for not attending to the ventilating furnace, five shillings and costs.

Same time and place, the agent of Rake Colliery, for not providing adequate ventilation against black-damp, ten shillings and sixpence and costs.

Same time and place, the person for the time being in charge of the mine, for not withdrawing the workpersons, five shillings and costs.

Same time and place, the underlooker of Elpit Edge Colliery, for not providing adequate ventilation against black-damp, five shillings and costs.

Same time and place, the person for the time being in charge of the mine, for not withdrawing workpersons, five shillings and costs.

27th September, at Rochdale Borough Court, the manager of Brotherod Colliery, for not providing adequate ventilation against fire-damp, ten pounds and costs. Also for not having the special rules published where they might be conveniently read by the workpersons, ten shillings and sixpence and costs. Also for not having the report entered in a book as to the working places and roads, ten shillings and sixpence and costs.

Same time and place, the fireman, being the person for the time being in charge of the mine, for not withdrawing the workpersons from dangerous fire-damp, five shillings and costs.

2nd October, at Royton, the manager of Alkrington Colliery, for not providing adequate ventilation against fire-damp, five pounds and costs.

Same time and place, the manager of Crow Knowl Colliery, for not providing adequate ventilation against black-damp, one pound and costs. Also for not having the report as to the state of the same, five shillings and costs. Also for not having the indicator to show the position of the load in the shaft attached whilst raising and lowering workpersons, five shillings and costs.

Same time and place, the owner of the same colliery for not paying the miners' wages by the weight of mineral gotten, he having then no exemption, five shillings and costs.

The penalties have been notified to the Receiver of Government Fines in order that they may be paid over and carried to the Consolidated Fund as directed by the Act.

For matters relating to the district generally, see chapter 1 in this report.

SUMMARY of fatal Accidents and Deaths annually in the Coal Mines of North and East Lancashire.

Year.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	10 Years Average.	1862.
Separate Accidents	60	60	73	78	73	52	60	55	55	67	63·3	56
Deaths - - -	113	82	87	89	84	99	138	68	58	82	90·0	59

Year.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	10 Years Average.	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Separate Accidents	60	60	61	58	71	61	74	66	61	62·8	78	69	68	63	44	56	54
Deaths - - -	68	64	66	69	84	65	76	86	61	69·8	116	74	75	75	51	92	99

MINES CLASSED UNDER THE COAL MINES REGULATION ACT.

LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in the portion of Mr. DICKINSON'S DISTRICT, consisting of NORTH and EAST LANCASHIRE, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878.													
Jan. 3	1	Scout Moor	Shuttleworth	Executrix of L. Duckworth	James Holden	Coal miner	24	Stone falling whilst he was in the act of propping it.	–	1	–	–	–
„ 10	2	Old Clough	Bacup	Geo. Hargreaves & Co.	James Ashworth	Ditto	29	Top coal falling where he had drawn props.	–	1	–	–	–
„ 12	3	Hulton, No. 11 Yard.	Over Hulton	Wm. Ford Hulton	Joseph Povey	Labourer	35	Hurt by falling off the pit bank 10½ feet. Died 11th December. Lunacy, congestion of brain. Doubtful whether the accident accelerated death.	–	–	–	–	1
„ 14	4	Bradford	Manchester	Bradford Colliery Co.	Stephen Amos James Hall	Coal miner Filler	35 19	Inundation of water, a level from the new winning being driven into a working from a former underground trial shaft.	–	–	–	2	–
„ „	5	Clifton Hall	Clifton	A. Knowles and Sons, Ld.	Wm. Greenhalgh	Coal miner	41	Coal falling as he was preparing to set a prop. Died 14th.	–	1	–	–	–
„ 22	6	Botany Bay	Clifton	Clifton and Kersley Coal Co.	James Kennedy	Ditto	29	Roof falling as he was filling coal	–	1	–	–	–
„ 29	7	Limehurst	Ashton-under-Lyne	Limehurst Coal Co.	Saml. Kirkman	Timberman	39	Roof falling as he was taking out a prop.	–	1	–	–	–
Mar. 12	8	Heskin Hall	Heskin	Rev. Wm. Michell	Thos. Christopher	Coal miner	44	Burned. He went into a fenced off place. Died 14th.	1	–	–	–	–
„ „	9	Unity Brook	Kersley	James Stott & Co.	Willm. Mayoh, and others.	Fireman, &c., as per list on accompanying plan.	—	Explosion of fire-damp in the cannel mine. An outburst of gas from the first large fall of roof in the west workings. Candles being used.	43	–	–	–	–
„ 14	10	Clifton Hall	Clifton	A. Knowles and Sons, Ld.	Saml. Mason	Coal miner	37	Dirt falling from a slip	–	1	–	–	–

List of the Fatal Colliery Accidents in North and East Lancashire—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878.													
April 2	11	Todmorden Moor	Dulesgate - -	James G. Dearden -	Luke Fielden -	Manager -	36	Explosion of fire-damp. He was provided with a safety lamp, but fire-damp not having been found for eight years he was examining with a candle.	1	–	–	–	–
„ 9	12	Cliviger -	Cliviger - -	Cliviger Coal Co. -	Philip Jenkins -	Labourer -	52	Caught between a railway waggon and the wall at the railway siding.	–	–	–	–	1
„ 12	13	Ashtonsfield, No. 1.	Little Hulton - -	Bridgewater Trust -	Patk. Langan -	Coal miner	34	Coal falling as he was holing to a former working. Died at Manchester Infirmary.	–	1	–	–	–
May 1	14	Hewlett -	Westhoughton - -	Wigan Coal and Iron Co., Ld.	Adam Rigby -	Ditto -	30	Roof falling - - -	–	1	–	–	–
„ 4		Knowl -	Wolstenholme -	James Butterworth and Son.	James Ashworth -	Ditto -	23	Died to-day from injuries received by roof falling 6th November last.	–	1	–	–	–
„ 15	15	Priestners -	Westleigh - -	Wigan Coal and Iron Co., Ld.	Leonard Meadows	Waggoner -	18	Roof falling. Insufficient spragging. Died 24th.	–	1	–	–	–
„ 16	16	Watergate -	Middle Hulton -	Bridgewater Trust -	Wright Jackson -	Coal miner	66	Roof falling where a pack wall was being built. Died 18th. Another miner, age 65, had his leg broken by the fall.	–	1	–	–	–
„ 22	17	Stand Lane -	Radcliffe - -	Stand Lane Colliery Co., Ld.	John Marsland -	Engineer -	51	Caught by the pumping machinery below the floor of the engine-house.	–	–	–	–	1
„ 31	18	Clifton Hall -	Clifton - -	A. Knowles and Sons, Ld.	Edwd. Hughes -	Filler -	18	Coal falling from the face. It knocked him against a prop that was close to.	–	1	–	–	–
„ „	19	Farnworth House	Duxbury - -	Thos. Whittle - -	Henry Entwistle -	Sinker -	20	Hurt, apparently by a piece of stone which had been blown by a shot on to a horse tree in the sinking pit and became moved when the signal wire was being pulled. Died next day.	–	–	1	–	–

List of the Fatal Colliery Accidents in North and East Lancashire—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878.													
June 12	20	Oakenclough -	Bacup - -	Exors. of James Butterworth.	J. L. Pilling -	- -	—	Stone falling from roof - -	–	1	–	–	–
„ 26	21	Coppicefield -	Worsley - -	Bridgewater Trust - -	James Gaskell -	Coal miner	59	Coal slipping from the side of a place which he was clearing.	–	1	–	–	–
July 4	22	Great Boys -	Tyldesley - -	Thos. Fletcher and Sons -	Thos. Harrison -	Ditto -	20	Coal falling as he was holing -	–	1	–	–	–
„ 5	23	Pendleton -	Pendleton - -	A. Knowles and Sons, Ld.	Timothy Walton -	Ditto -	51	Stone falling from a slip - -	–	1	–	–	–
„ 29	24	Anderton Hall	Blackrod - -	Dewhurst, Hoyle, and Smethurst.	James Greenhalgh	Engineman	61	Crushed between the cage and a guide rod at the bottom of shaft, as he was getting into the cage before the proper signal had been given.	–	–	1	–	–
Aug. 13	25	Street Gate -	Little Hulton -	Mattw. Bennett and Bros.	Abraham Fletcher	Coal miner	64	Coal falling in his working place. Died 15th.	–	1	–	–	–
„ 15	26	Springwell -	Pilkington - -	Stand Lane Colliery Co., Ld.	Geo. Wallace -	Waggoner	16	Dirt falling from a slip in the Ashclough Mine.	–	1	–	–	–
„ 23	27	Brackley -	Middle Hulton -	Bridgewater Trust -	Thos. Humphries -	Navvie -	36	A stretcher falling out as another one was being put in, in an open cutting for a day eye slope. Died at Bolton Infirmary 15th September.	–	–	–	–	1
„ 27	28	Westleigh -	Westleigh - -	James Diggle - -	Thos. Penkthman -	Coal miner	—	Stone falling suddenly from between slips.	–	1	–	–	–
Sept. 2	29	Kersley -	Kersley - -	Saml. Scowcroft and Sons	Edmund Isherwood	Ditto -	33	Roof falling from a slip where he was ridding a fall in the Moss Pit.	–	1	–	–	–
„ 13	30	Outwood -	Outwood - - -	Thos. Fletcher and Sons -	Wm. Barlow -	Ditto -	33	Roof falling as he and others were timbering.	–	1	–	–	–
„ 17	31	Arley, No. 2. -	Middle Hulton -	Wm. Ford Hulton -	Holland Bradley -	Waggon setter	72	A tub waggon falling out of a new tippler which was being arranged at the screens. Died 6th February 1879.	–	–	–	–	1
„ 18	32	Ditto -	Ditto - -	Dittc -	Wm. Partington -	Ditto -	68	Ditto Ditto Died 29th October 1878.	–	–	–	–	1

List of the Fatal Colliery Accidents in North and East Lancashire—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878.													
Sept. 18	33	Stand Lane -	Radcliffe - -	Stand Lane Colliery Co., Ld.	Thos. Haslam -	Timberman	24	Hurt by one of the timbers which he and others were setting. Died 30th.	–	1	–	–	–
„ 26	34	Welch Whittle	Welch Whittle -	Blainscough Hall Colliery Co.	Wm. Kenyon -	Fireman -	43	Falling out of a bucket when about half-way up a small shaft, about 12 yards deep, which was being sunk in the mine. Having gone down too soon after a shot had been fired and being apparently overpowered by powder smoke mixed with a little after-damp from a small blower of fire-damp, he gave an alarm, and was being hastily wound up by a windlass.	–	–	–	1	–
„ 27	35	Pendlebury -	Pendlebury - -	A. Knowles and Sons, Ld.	Shemei Greenhalgh	Pony driver	18	Leg jammed by the tub on which he was riding getting off the rails. Died 13th February 1879.	–	–	–	1	–
Oct. 3	36	Priestners -	Westleigh - -	Wigan Coal and Iron Co., Ld.	Wm. Hindley -	Labourer -	63	The overbalancing of a crane, the wheels not being clipped down, while discharging a waggon.	–	–	–	–	1
„ 14	37	Mosley Common	Tyldesley - -	Bridgewater Trust -	Robt. Ruffley -	Coal miner	60	Stone falling from the roof in a pass-bye on the level.	–	1	–	–	–
„ 17	38	Victoria - -	Atherton - -	Fletcher, Burrows, & Co.	Saml. Kersley -	Spademan	65	Caught by a railway waggon on the siding.	–	–	–	–	1
„ 22	39	Watergate -	Middle Hulton -	Bridgwater Trust - -	Wm. Hart -	Coal miner	21	Roof, &c. falling from a slip as he was holing. Died 31st.	–	1	–	–	–
„ 25	40	Linnyshaw -	Worsley - -	Ditto - -	Henry Tonge -	Ditto -	32	Coal, which he was taking down, falling from an unseen slip.	–	1	–	–	–
„ 26	41	Blainscough Hall	Coppull - -	Blainscough Hall Colliery Co.	Thos. Iddus -	Hooker-on -	17	Crushed between the cage and a horse-tree. He was getting out of the cage after the signal to go on had been given.	–	–	1	–	–

List of the Fatal Colliery Accidents in North and East Lancashire—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Nov. 2	42	Sanderson -	Worsley - -	Bridgwater Trust -	John Rigby -	Coal miner	48	Roof falling as he took out a prop -	–	1	–	–	–
„ 15	43	Linnyshore -	Ditto - -	Ditto -	Mark Barlow -	Ditto -	40	Dirt falling from between two slips in a bay.	–	1	–	–	–
„ 16	44	Robin Hood -	Clifton - -	Clifton and Kersley Coal Co.	Wm. Corns -	Ditto -	38	Roof coal and dirt which he was getting down falling upon him.	–	1	–	–	–
„ 18	45	Botany Bay -	Ditto - -	Ditto - -	Patk. McQuin -	Ditto -	37	Roof coal falling in the bay. Died 29th.	–	1	–	–	–
„ 19	46	Gannow - -	Burnley -	Exors. of John Hargreaves	James Hadley -	Waggoner -	20	A tram on which he and another boy were riding running away down a slope and getting off the rails. Died 23rd.	–	–	–	1	–
„ 2	47	Great Boys -	Tyldesley - -	Thos. Fletcher and Sons -	John Bartonwood -	Dayman -	60	Caught by a tub on an incline, the prop to which the pulley was fastened having given way.	–	–	–	1	–
Dec. 2	48	Agecroft -	Pendlebury - -	A. Knowles and Sons, Ld.	John Collier -	Stoker -	40	Scalded by steam and water in a boiler-house in the mine. The joint of the mud man-hole, near the bottom of the front of one of three connected boilers, having been made up with a new india-rubber ring, but the screwing not sufficiently followed up as the steam rose, scalding water escaped which lowered the water in the boiler, until, as men were endeavouring to rectify matters, the fusible plug in the top of one of the tubes melted, and the tube collapsed. Collier died 8th December and Hartshorn 8th January.	–	–	–	2	–
					John Hartshorn -	Head engineer	51						
„ 4	49	Great Boys -	Tyldesley - -	Thos. Fletcher and Sons -	James Smethurst -	Coal miner	60	Walking over the wall of the pit bank. Died.	–	–	–	–	1

List of Fatal Colliery Accidents in North and East Lancashire—*continued.*

Date.	No. of Accident.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above ground.
1878.													
Dec. 6	50	Royton -	Oldham - -	Oldham, Middleton, and Rochdale Coal Co., Ld.	Chas. Cocker	Engineman	31	Falling down the shaft from the surface, he having removed the fence for the purpose of pulling out the water tank.	–	–	1	–	–
„ 9	51	Brinsop Hall -	Westhoughton -	Brinsop Hall Coal Co., Ld.	Joseph Wood -	Coal miner	32	Coal falling as he was holing without sprags Arley Mine.	–	1	–	–	–
„ 12	52	Manor -	Kersley - -	Clifton and Kersley Coal Co.	Henry Schofield -	Ditto -	23	Roof coal falling from a back -	–	1	–	–	–
„ 14	53	Denton Lane -	Chadderton - -	Chamber Colliery Co., Ld.	Lees Hall -	Ditto -	29	Roof falling as he was getting coal. Died in Oldham Infirmary.	–	1	–	–	–
„ 20	54	Mosley Common	Tyldesley - -	Bridgwater Trust -	Saml. Thornley -	Waggoner -	18	Roof falling from a slip on an incline as he was seeing whether the tubs which were running would clear a small quantity which had previously fallen.	–	1	–	–	–
								Total at the North and East Lancashire Coal Mines, 54 fatal accidents with 99 deaths -	45	33	4	8	9

In addition to the foregoing the following fatal accidents and sudden deaths, which are not apparently comprised by the Act, came under my notice in connexion with Coal Mines in North and East Lancashire :—

Feb. 5 Irving Child, miner, died in his working place in Hole House Pit, Cliviger Colliery.

„ 27 Wm. Marsden, flagstone miner, found dead at the bottom of Barlow's abandoned coal pit shaft, Entwistle, he having, as it was supposed, jumped down on the previous day.

Mar. 21 Joseph Anderson, coal miner, fell down dead, at 12.30 noon, while at work in Towneley Pit, several men were working near, and he appeared to have been in his usual health.

June 7 Richard Collier, died after falling from a coal waggon on the Lancashire and Yorkshire Railway siding at the terminus of the Chain Road from Agecroft Colliery.

„ 29 John Whittle, banksman at No. 1 Ashtons Field Pit, Little Hulton, died from sunstroke.

Dec. Thos. Cook, pit sinker, died suddenly on the pit bank after coming up one of the Newtown sinking pits, it appearing that the death arose from natural causes, and not from gas or accident.

LIST OF MINES, MANAGERS, &c. under the Coal Mines Regulation Act in the portion of Mr. DICKINSON'S DISTRICT consisting of NORTH and EAST LANCASHIRE, 1878.

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Altham Colliery Co., Altham, Accrington	Houghton Barn	Altham	–	–	Thomas Mackintosh.	1st Oct. 1873	——	Record Plan of Arley Mine sent to Home Office 1877.
	Whinney Hill	Ditto	–	–	Ditto		Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	——
Arley Main Co., Horwich Junction, Bolton.	Park Hall	Blackrod	–	–	Thomas M. Yates.	9th Mar. 1874. (Award.)	Boys, sec. 5, 1872, for Lower Yard Mine.	——
Ashton Moss Colliery Co., Audenshaw, Manchester.	Ashton Moss	Ashton-under-Lyne	–	–	James Wallwork.	9th Dec. 1874	——	——
Ashworth, Edmund, and Sons, Egerton Mills, Bolton.	Cheetham Close	Egerton	–	–	—	6th Aug. 1874	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	——
Ashworth, Ralph, and Co., Ld., Littleborough, Manchester.	Starring Coal and Fire-clay.	Littleborough	–	–	John Howarth	22nd Oct. 1873	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Ashworth and Tomlinson	Broadhalgh	Rochdale	–	–	—	16th April 1875	——	——
Astley and Tyldesley Coal and Salt Co., Ld., Tyldesley, Manchester.	Cross Hillock	Astley	–	–	Henry Knight	9th Mar. 1874, (Award.)	——	——
	Nook	Ditto	–	–	Joseph Clementson.		Weighing, sec. 17, 1874	——
	Tyldesley	Tyldesley	–	–	John Walshaw		——	——
Bank Colliery Co.	Bank	Little Hulton, Bolton	–	–	ThomasGrundy	14th Mar. 1874 (Award.)	——	——
Bardsley Colliery Co.	Bardsley	Ashton-under-Lyne	–	–	George Wild	7th July 1874	——	——
Barker, Jas., and Sons, St. Thomas' Road, Chorley.	Pemberton House	Welch Whittle	–	–	William Jones	1st Oct. 1873	Weighing, sec. 17, 1878	——
Bennett, Matthew, and Brothers.	Street Gate	Little Hulton, Bolton	1	1	Roger Wallwork.	14th Mar. 1874. (Award.)	——	——
Berry, John, and Sons	Smethurst Hall Clay	Birtle, Bury, Lanc.	–	–	—	—	——	——
Blainscough Hall Colliery Co., Coppull, Chorley.	Blainscough Hall	Coppull	1	1	John Dickinson	9th Mar. 1874 (Award.)	——	——
	Welch Whittle	Welch Whittle	1	1	Ditto			

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Bradford, the Earl of,—Estate Office, Bolton	Aqueduct	Haulgh	–	–	John Openshaw	14th Mar. 1874. (Award.)	——	——
	Burnden	Burnden	–	–	Richard Harrison.		——	——
	Gravel Hole	Great Lever	–	–	John Openshaw		Boys, sec. 5, 1875. Weighing, sec. 17, 1874.	——
	Great Lever	Ditto	–	–	Ditto		——	——
	Hacken	Darcy Lever	–	–	—		——	——
	Raikes	Great Lever	–	–	Richard Harrison.		——	——
Bradford Colliery Co. (Johnson and Livesey).	Bradford	Manchester	1	2	Thomas Arrandale.	9th Mar. 1874. (Award.)	——	——
Bridgewater Trustees—Colliery Office, Walkden, Bolton	Ashtonsfield	Little Hulton	1	1	James Bowker	9th Mar. 1874. (Award.)	——	——
	Brackley	Middle Hulton	1	1	Ditto		——	——
	Bridgewater	Worsley	–	–	Thomas Wallwork.		——	——
	Edge Fold (Pumping).	Ditto	–	–	Ditto		Boys, sec. 5, 1873, for each of the Trustees Pits in the Black, Binn, Brassy, Cannel, Crumbouke, Five Quarters, Half Yard, Three Quarters, and Yard Mines where they are being worked.	Record Plans of the Crumbouke, Brassy, and Seven Feet Mines at Mangnalls, Madams Wood, and Barracks Pits sent to Home Office 1876.
	Ellesmere	Ditto	–	–	James Bowker			
	Ellenbrook	Tyldesley	–	–	Thomas Wallwork.			
	Gatley	Ditto	–	–	Ditto			——
	Linnyshaw	Worsley	2	2	Ditto		——	Record Plans of the Brassy Mine along with the Gatley Pit, and of the Brassy Mine, along with the Edgefold Pit, sent to the Home Office 1877.
	Lords Moss Field	Farnworth	–	–	James Bowker		——	
	Machine	Ditto	–	–	Ditto		——	
	Mangnalls	Worsley	–	–	Thomas Wallwork.		Weighing, sec. 17, for the canals throughout these pits.	——
	Mosley Common	Tyldesley	2	2	Ditto			——

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Bridgewater Trustees—Colliery Office, Walkden, Bolton—*cont.*	Sanderson - -	Worsley - -	1	1	Thomas Wallwork.	9th Mar. 1874. (Award.)	——	——
	Saplingfield -	Middle Hulton -	–	–	James Bowker		——	——
	Tonges Field - -	Farnworth - -	–	–	Ditto -		——	——
	Wardley Coppice Field.	Worsley - -	1	1	Thomas Wallwork.		——	——
	Watergate - - -	Middle Hulton -	2	2	James Bowker		——	——
Brierley, James, and Son -	Brandwood Moor -	Stacksteads, Manchester.	–	–	John Brierley	21st Nov. 1873	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Brinsop Hall Coal Co., Ld., Wigan - - -	Brinsop Hall, Arley	- - -	1	1	William Holding	17th July 1874.	——	——
	Ditto King -	Westhoughton -	–	–	Ditto -			
	Ditto Yard -	- - -	–	–	Ditto -			
Broad Oak Colliery Co., Ashton-under-Lyne -	Broad Oak - -	Ashton-under-Lyne -	–	–	Thomas B. Mills.	17th Nov. 1873	Boys, sec. 5, 1872. For the Peacock Mine.	——
	Nook - -	Ditto - -	–	–				
Brocklehurst, Thomas -	Victoria - -	Rumworth, Bolton -	–	–	William F. Barton.	15th Oct. 1873	——	——
Brooks and Pickup, Towneley, Burnley - -	Cupola - -	Hameldon - -	–	–	Thomas Alderson.	9th Mar. 1874. (Award).	Weighing, sec. 17, 1873 -	——
	Portsmouth Fireclay.	Cliviger - -	–	–	James Ingham		Ditto - -	——
	Towneley Arley -	Burnley - -	–	–	Ditto -		Ditto - -	——
	Towneley Bing -	Towneley - -	–	–	—		Ditto - -	Discontinued.
	Towneley Drift -	Ditto - -	–	–	Richard Bentley		Ditto - -	——
	Wholaw Nook -	Wholaw - -	–	–	—		Ditto - -	Discontinued.

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Brothers, O., Ld. - -	Livesey Fire-clay Works.	Livesey, Blackburn -	–	–	Arthur W. Brothers.	9th July 1874	——	——
Buckley, John, Exors. of, Wharf Mill, Rochdale -	Bell Isle - -	Tonnacliffe - -	–	–	—	15th June 1874.	Weighing, sec. 17, 1878 -	——
	Tonnacliffe - -	Ditto - -	–	–	—		Ditto - -	——
Butterworth and Brooks, Sunnyside, Rawtenstall, Manchester.	Hailstorm - -	Cowpe, Waterfoot -	–	–	—	28th Oct. 1874	——	——
Butterworth, Edmund, and Sons, Denshaw Vale Print Works, Delph, Saddleworth.	Crow Knowl - -	Crompton - -	–	–	James Marland	4th July 1874	Weighing, sec. 17, 1878 -	——
Butterworth, James, Exors. of.	Oaken Clough -	Bacup - -	1	1	John Lord -	22nd Aug. 1874	Boys, sec. 5, 1878. Weighing, sec. 17, 1878. 2nd outlet, sec. 22, sub-sec. C., for Yard Mine, 1878.	——
Butterworth, James and Son, Greenbooth Rochdale.	Knowl - -	Woodhouse Lane -	–	1	C. M. Taylor -	11th Dec. 1873	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	Accident in previous year.
Chamber Colliery Co., Ld., Hollinwood, Manchester -	Alkrington -	Alkrington -	–	–	George H. Hollingworth.	9th Mar. 1874. (Award.)	Guides in No. 1 Shaft, but not beyond end of 1879.	——
	Oak - -	Hollinwood -	–	–	Ditto -		Boys, sec. 5, 1872, for Bent Mines.	——
	Chamber - -	Oldham - -	–	–	James Jackson		Ditto - -	——
	Denton Lane -	Chadderton - -	1	1	George H. Hollingworth.		Ditto - -	——
	Ferney Field -	Ditto - -	–	–	Ditto -		Ditto - -	——
	Hunt Clough - -	Ditto - -	–	–	Ditto -		Ditto - -	——
	Stockfield - -	Ditto - -	–	–	Ditto -		Ditto - -	——
	Wood Park - -	Ashton-under-Lyne -	–	–	Ditto -		Ditto - -	——
Charlton, Francis, and Sons	Wharton - - -	Little Hulton, Bolton	–	–	Edward Kavanagh.	14th Mar. 1874. (Award.)	——	——

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Clifton and Kersley Coal Co., Clifton Manchester -	Botany Bay - -	Clifton - -	2	2	James Winterbottom.	14th Mar. 1874. (Award.)	Weighing, sec. 17, 1875 -	——
	Little Hey (Pumping).	Kersley -	–	–	—		——	Record Plans of Yard and Plodder Mines sent to the Home Office by former owners 1877.
	Manor - -	Ditto - -	1	1	William Wallwork.		Weighing, sec. 17, 1875 -	
	Newtown - -	Clifton - -	–	–	—		——	——
	Robin Hood - -	Ditto - -	1	1	Samuel Hamer		Weighing, sec. 17, 1875 -	——
	Spindlepoint -	Kersley - -	–	–	William Nelson		Ditto - -	——
	Wetearth - -	Clifton - -	–	–	John Smethurst.		Ditto - -	——
Cliviger Coal Co., Cliviger Collieries, near Burnley -	Coppy - -	Cliviger - -	–	–	John Jobbling.	2nd Dec. 1873	Weighing, sec. 17, 1874 -	——
	Hurstwood - -	Ditto - -	–	–				
	Railway -	Ditto - -	1	1				
	Union - -	Ditto - -	–	–				
Cockeymoor Colliery Co. -	Cockeymoor - -	Radcliffe, Manchester	–	–	H. G. Wheeler	4th Oct. 1873	——	——
Coney Coal and Fire-clay Co., Ld., Darwen.	Coney - -	Over Darwen -	–	–	—	17th July 1874	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Crankshaw, John - -	Winter Hill Fire-clay	Horwich, Bolton -	–	–	—	22nd Jan. 1875	Weighing, sec. 17, 1873 -	——
Crossley, Charles -	Crook Bank - -	Wardle, Rochdale -	–	–	—	19th Aug. 1874	Weighing, sec. 17, 1874 -	——
Darcy Lever Coal Co., Darcy Lever, Bolton - -	Croftside - -	Darcy Lever -	–	–	Robert Hutchinson.	11th Mar. 1874. (Award.)	——	——
	Davenport - -	Ditto - -	–	–	Thomas Smith		Weighing, sec. 17, 1876 -	——
	Snow Hill - -	Ditto - -	–	–	Robert Hutchinson.		——	——
	Victoria - -	Ditto - -	–	–	Ditto -		——	——

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Darwen Mining Co., Ld., Blackburn.	Whitebirk - -	Lower Darwen -	–	–	Thomas Taylor	2nd Oct. 1873	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	——
Dearden, James Griffiths,— The Orchard, Rochdale -	Cartridge Nook -	Whitworth - -	–	–	Richard Mathaw.	2nd Mar. 1874	Boys, sec. 5, 1874, for Half Yard and Mountain Mines. Weighing, sec. 17, 1874.	——
	Handle Hall -	Calderbrook -	–	–	—		Weighing, sec. 17, 1874 -	Discontinued.
	Land - -	Shawforth -	–	–	ThomasDearden		Boys, sec. 5, 1874, for Half Yard and Mountain Mines. Weighing, sec. 17, 1874.	——
	South Grain -	Todmorden Moor, Dulesgate.	–	–	Luke Fielding		Weighing, sec. 17, 1874 -	——
	Toadleach - -	Healey - -	–	–	John Dearden		Boys, sec. 5, 1874, for Half Yard and Mountain Mines. Weighing, sec. 17, 1874.	——
	Todmorden Moor -	Clough Foot, Dulesgate.	1	1	James Lord -		Weighing, sec. 17, 1874 -	——
	Tooter Hill - -	Sharneyford -	–	–	John Lord -		Boys, sec. 5, 1874, for Half Yard and Mountain Mines. Weighing, sec. 17, 1874.	——
	Wallnook - -	Wardle - -	–	–	Thomas Dearden		Ditto ditto -	——
Denton Colliery Co., Ld., Denton, Manchester -	Albert - -	Haughton - -	–	–	Peter Armstrong.	9th Mar. 1874 (Award.)	Boys, sec. 5, 1872, for Two Feet and Peacock Mines.	——
	Burton Nook - -	Denton - -	–	–	Ditto -		——	——
	Denton - -	Ditto - -	–	–	Ditto -		——	——
	Great Wood -	Ditto - -	–	–	Ditto -		——	——
	Parsonage - -	Ditto - -	–	–	Ditto -		——	——
	Top Pit - -	Ditto - -	–	–	Ditto -		——	——

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Denton Colliery Co., Ld., Denton, Manchester—*cont.*	Victoria - -	Haughton - -	–	–	Peter Armstrong.	9th Mar. 1874. (Award.)	Boys, sec. 5, 1872, for Two Feet and Peacock Mines.	——
Derbyshire, Ralph, and Son, Hendham Vale, Manchester.	Bench Carr Fire-clay	Wardle, Rochdale -	–	–	—	1st Sept. 1874	Weighing, sec. 17, 1876 -	——
Diggle, James, Westleigh Collieries, Leigh, Manchester.	Heyfield - -	Westleigh - -	–	–	WilliamPilling	9th Mar. 1874. (Award.)	——	——
	Lower Hall - -	Ditto - -	–	–	Ditto -		——	——
	Owens - -	Ditto - -	–	–	Ditto -		——	Owens abandoned. Record Plans of Five Feet Mine sent to Home Office 1875. Ditto of Six Feet Mine sent to Home Office 1878.
	Westleigh - -	Ditto - -	1	1	Ditto -		——	
Duckworth, Lawrence, Executrix of, Sheep Hey, Ramsbottom, Manchester	Scout Moor - -	Shuttleworth -	1	1	James Duckworth.	31st Oct. 1873	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	
	Shipperbottom -	Walmersley -	–	–	Ditto -		Ditto ditto -	——
Dunkenhalgh Colliery Co., Ld., Church, near Accrington - -	Blackburn - -	Whitebirk, Blackburn	–	–	Peter Wright Pickup.	19th Mar. 1874.	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
	Coppy Clough and Park.	Church - -	–	–	Ditto -		Ditto ditto -	——
	Dillhall - -	Enfield - -	–	–	Ditto -		Ditto ditto -	——
	Rishton - -	Rishton - -	–	–	Ditto -		Ditto ditto -	——
Ealees Colliery Co. -	Ealees - -	Littleborough, Manchester.	–	–	John Halliday	31st Oct. 1873	Ditto ditto -	Formerly executors of B. Lees.
Earnshaw, Luke - -	Midgelden Brick Works.	Dulesgate, Todmorden	–	–	—	19th Aug. 1874	Weighing, sec. 17, 1874 -	Discontinued.
Eccleshill Coal Co., Ld., Darwen - - -	Princess - -	Eccleshill - -	–	–	—	—	——	Ditto.
	Snowball - -	Over Darwen -	–	–				
	Tithe Barn - -	Ditto - -	–	–				
	Ellisonfold - -	Ditto - -	–	–				

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Entwisle, James Pickup, Sough, Darwen.	Old House	Sough	–	–	—	—	—	—
Entwisle, Ralph, and Co., Ld., Darwen Fire-clay Works, Darwen.	Cranberry Moss	Entwistle	–	–	Roger Taylor	19th June 1874	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	Record Plan of No. 3 Pit workings sent to Home Office 1875.
Entwisle, Robt. S., and Wm., Rose Hill, Darwen.	Entwistle	Ditto	–	–	—	—	—	Discontinued.
Evans, Wm., 3, Cross Street, Manchester.	Roundthorne	Oldham	–	–	—	11th Feb. 1879	—	—
Fish Brothers, & Co.	Wilders Moor	Rivington, Bolton	–	–	James Fish	6th Aug. 1874	—	—
Fishwick, H. H., and Co., Brotherod Colliery Office, Rochdale	Brotherod	Rochdale	–	–	James Holt	21st Oct. 1873	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	—
	Cronkeyshaw	Ditto	–	–	Ditto		—	—
	Stoney Heys	Healey	–	–	Ditto		Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	Discontinued.
Fletcher, James, and Brothers, Smithy Bridge, Rochdale.	Higher Shore	Littleborough, Manchester.	–	–	Thomas Lord	17th July 1874	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	—
Fletcher, John, Ladyshore Colliery, Little Lever, Bolton	Owl Hole	Little Lever	–	–	Daniel Simmons	9th Mar. 1874. (Award.)	—	—
	Victoria	Ditto	–	–	Edward Stott			
Fletcher, Burrows, and Co., Atherton Collieries, Atherton, Manchester	Chanters	Atherton	–	–	John S. Burrows.	9th Mar. 1874. (Award.)	Weighing, sec. 17, 1873	Weighing now.
	Crumbouke Day Eye	Ditto	–	–	Ditto		Ditto	
	Gibfield	Ditto	–	–	Ditto		Ditto	
	Howbridge	Ditto	1	1	Ditto		Ditto	
	Lover's Lane	Ditto	–	–	Ditto		Ditto	

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Fletcher, Thomas, and Sons, Bradley Fold Collieries, Little Lever, Bolton -	Bally - -	Little Lever -	–	–	John Howell -	14th Mar. 1874.(Award.)	——	——
	Black Moss -	Radcliffe - -	–	–	John Sixsmith		Weighing, sec. 17, 1876 -	——
	Breightmet -	Breightmet -	–	–	John Howell -		——	——
	Harpurfold -	Little Lever -	–	–	John Sixsmith		Weighing, sec. 17, 1876 -	——
	Middle Bents -	Ditto - -	–	–	John Howell -		——	——
	Railway - -	Ainsworth - -	–	–	Ditto -		——	——
	Stopes (Hulme Pit)	Little Lever -	–	–	Thomas Smith		Weighing, sec. 17, 1876 -	——
	Wolstenholmefold -	Radcliffe - -	–	–	Ditto -		Ditto - -	——
Fletcher, Thomas, and Sons	Great Boys - -	Tyldesley, Manchester	3	3	John Howell -		——	——
Fletcher Thomas, and Sons, Outwood Colliery, Manchester - - -	Outwood - -	Outwood - -	1	1	Richard Drinnan.		——	——
	Ringley - -	Ditto - -	–	–	Ditto -		Weighing, sec. 17, 1876 -	——
Gerrard, John, and Son -	Clamerclough Pottery	Farnworth, Bolton -	–	–	—	17th July 1874	——	——
Gibson, John, and Co. -	Smithfold - -	Little Hulton, Bolton	–	–	J. W. Hopwood	11th Mar. 1874	Boys, sec. 5, 1872, for Cannel mine.	Discontinued.
Glodwick Colliery Co. -	Glodwick - -	Oldham - -	–	–	—	—	——	Ditto.
Great Harwood Co., near Accrington - -	Great Harwood -	Great Harwood -	–	–	J. F. Seddon -	15th Oct. 1873	Weighing, sec. 17, 1873 -	——
	Martholme -	Ditto - -	–	–	George Howarth.		Ditto - -	——
Haigh, Reuben, and Co. -	Foulclough - -	Inchfield Moor, Walsden, Todmorden.	–	–	John Haigh -	1st Oct. 1873	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Hall, Adam - - -	Laneshaw Bridge -	Colne - -	–	–	—	—	——	Abandoned, Record Plan sent to Home Office 1878.

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Hall and Rogers, Smithy Bridge, Littleborough.	Cleggswood Fire-clay	Littleborough	–	–	—	13th June 1874	Weighing, sec. 17, 1874	—
Hardcastle, Frank, Breightmet Colliery, Bolton	Breightmet	Breightmet	–	–	William Rostron.	24th Nov. 1873.	Weighing, sec. 17, 1873	—
	Higher Croft	Ditto	–	–	Ditto		Ditto	—
	Tonge	Tonge	–	–	Ditto		Ditto	—
Hardcastle, Thomas, Bradshaw Works, Bolton.	Hillend	Harwood	–	–	—	14th Mar. 1874. (Award.)	Weighing, sec. 17, 1874	Discontinued.
Hardman, Brothers, Acres Mill, Stacksteads, Manchester.	Helmclough	Greensmoor	–	–	Levi Jackson	29th June 1874	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	—
Hargreaves, George, and Co., Baxenden Collieries, Baxenden, Manchester	Bellthorn	Yate and Pickup Bank.	–	–	John Thos. Howat.	15th June 1874.	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	—
	Cat Hall	Broad Oak, Accrington.	–	–	Ditto		Ditto ditto	—
	Dewhurst Drift	Baxenden	–	–	George Smith		Ditto ditto	—
	Hole in Bank	Ditto	–	–	Ditto		Ditto ditto	—
	Laund	Ditto	–	–	John Thos. Howat.		Ditto ditto	—
	Miller Fold	Accrington	–	–	—		Ditto ditto	Discontinued.
	Moleside	Ditto	–	–	—		Ditto ditto	Ditto.
	Railway	Baxenden	–	–	George Smith		Ditto ditto	—
	Scaitcliffe	Accrington	–	–	—		Ditto ditto	Discontinued.
	Wood Nook	Ditto	–	–	John Thos. Howat.		Ditto ditto	—
Hargreaves, George, and Co., Rossendale Collieries, Newchurch, Manchester	Brex	Lower Whitwell Bottom.	–	–	John Tattersall	15th June 1874.	Ditto ditto	—
	Gambleside	Crawshaw Booth	–	–	J. Illingworth Law.		Ditto ditto	—

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Hargreaves, George, and Co., Rossendale Collieries, Newchurch, Manchester—*cont.*	Goodshaw Hill	Higher Booths	–	–	J. Illingworth Law	15th June 1874.	Boys, sec. 5. 1872. Weighing, sec. 17, 1873.	—
	Grime Bridge	Middle Whitwell Bottom.	–	–	John Tattersall		Ditto ditto	—
	Meadows	Bacup	–	–	John Lord		Ditto ditto	—
	Nabb	Newchurch	–	–	John Tattersall		Ditto ditto	—
	Old Clough	Bacup	1	1	John Lord		Ditto ditto	—
	Swinshaw	Crawshaw Booth	–	–	John Tattersall		Ditto ditto	—
	Stacksteads	Stacksteads	–	–	John Lord		Ditto ditto	—
Hargreaves, John, Exors. of — Burnley Collieries, Burnley	Bank Hall	Burnley	–	–	John Waddington.	24th Oct. 1873.	Weighing, sec. 17, 1873	—
	Beehole	Ditto	–	–	Ditto		Ditto	Discontinued.
	Broughton	Ightenhill Park	–	–	Ditto		Ditto	—
	Burnt Hills	Wholaw Nook	–	–	Ditto		Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	—
	Clifton	Burnley	–	–	Ditto		Weighing, sec. 17, 1873	—
	Gannow	Habergham	1	1	Ditto		Ditto	—
	Habergham	Ditto	–	–	Ditto		Ditto	—
	Hapton Valley	Hapton	–	–	Ditto		Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	—
	Padiham	Padiham	–	–	Ditto		Weighing, sec. 17, 1873	—
	Reedley	Reedley Hallows	–	–	Ditto		Ditto	—
	Rowley	Burnley	–	–	Ditto		Ditto	—
	Trawden	Trawden	–	–	Ditto		Ditto	—

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Heap, Thomas, and Sons, Haugh, Rochdale.	Haugh Hey -	Butterworth -	–	–	Robert Evans	16th Dec. 1875	Boys, sec. 5, 1875. Weighing, sec. 17, 1878.	——
Heys, Henry, Brandwood Quarry, Stacksteads, Manchester.	Tongue End Pasture	Facit - -	–	–	—	28th July 1874	Weighing, sec. 17, -	——
Hic-bibi Coal and Cannel Co., Ld., Chorley, Lanc. -	Ellerbeck -	Coppull - -	–	–	John Corner -	—	——	——
	Hic-bibi - -	Ditto - -	–	–	John Davenport.	14th Mar. 1874. (Award.)	——	Record Plan sent to Home Office 1876 (by Whaley and others, former owners).
	Hilton House -	Westhoughton -	–	–	John Ince -	20th June 1874	——	
Hill, Abraham - -	Rock View - -	Whitworth, Rochdale	–	–	George Hy. Hill.	28th Feb. 1874 -	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	——
Howard, James - -	Sheep Bank - -	Littleborough, Manchester.	–	–	James Brown	31st Oct. 1873 -	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Hulton, Wm. Ford, Hulton Colliery Office, Hulton Park, Bolton - -	Arley - -	Over Hulton -	2	2	Edwd. P. Sewarth.	14th Mar. 1874. (Award.)	Boys, sec. 5, 1873, in the Half Yard and Three Quarters Mines.	——
	Park - -	Ditto - -	–	–	William Kearsley.			
	3 quarters - -	Ditto - -	–	–	Ditto -			
	Yard - -	Ditto - -	1	1	Major Crook -			
Hyde and Haughton Coal Co., Hyde, Manchester -	Broomstair - -	Denton - -	–	–	Joseph Goodwin.	1st Oct. 1873	——	——
Ireland, Buckley, and Co. -	Swindrod Colliery and Firebrick Works.	Littleborough, Manchester.	–	–	—	4th July 1874 -	Weighing, sec. 17, 1874 -	——
Jones & Co. - - -	Rhodes Bank - -	Oldham - -	–	–	James Lees -	14th Mar. 1874. (Award.)	——	——
Kayss, Thos. Bainbridge, Exors. of, Wray, Lancaster.	Smear Hall - -	Wray-with-Botton -	–	–	—	14th Aug. 1874 -	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	Formerly John Newby.
Kershaw Brothers - -	Sladen Mill - -	Littleborough, Manchester.	–	–	—	31st Oct. 1875 -	Weighing, sec. 17, 1875 -	——

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established, See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Knowles, Andrew, and Sons, Ld., Office, Pendlebury, near Manchester	Agecroft	Pendlebury	1	2	John Crook		Weighing, sec. 17, 1873	—
	Allen's Green	Radcliffe	—	—	Samuel Rothwell.		Ditto	—
	Canal Side	Bank Top, Radcliffe	—	—	—		Ditto	—
	Clifton Hall	Clifton	3	3	John Barker		Ditto	—
	Clifton Moss	Ditto	—	—	Thomas Green		Ditto	—
	Dingle	Little Lever	—	—	James Howcroft.		Ditto	—
	Farnworth Bridge	Ditto	—	—	William Settle		Ditto	—
	Foggs	Darcy Lever	—	—	Thomas Taylor.		Ditto	—
	Green Lane	Radcliffe	—	—	—	9th Mar. 1874. (Award.)	Weighing, sec. 17, 1873. Guides and cover over head, G. Rs. 19 and 20.	Guides and cover exempted whilst making communication with Allen's Green Pit.
	Hagside	Bank Top, Radcliffe	—	—	Samuel Mills		Weighing, sec. 17, 1873	Record Plans of the Trencherbone and Cannel seams worked at Ringley Fold Colliery, near Stoneclough sent to Home Office 1877.
	Hampson Meadow	Radcliffe	—	—	Samuel Rothwell.		Ditto	
	New Rivin	Little Lever	—	—	James Norris		Ditto	
	Openshaw Fold	Bank Top, Radcliffe	—	—	Samuel Mills		Ditto	Record Plans of the Yard and Plodder Mines worked at Little Hey Colliery, Kersley, sent to Home Office 1877.
	Pendlebury	Pendlebury	1	1	Simon Horrocks.		Ditto	
	Pendleton	Pendleton	1	1	Israel Barker		Ditto	—
	Whittaker Bridge	Radcliffe	—	—	Samuel Rothwell.		Ditto	—
	Withins Lane	Ditto	—	—	Ditto		—	—
Law, David	Intake	Waterfoot, Manchester.	—	—	—	24th July 1874	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	—

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Leach, James, Kitcliffe, Rochdale.	Elpit Edge - -	Butterworth - -	–	–	John Whitehead.	17th July 1874 -	Boys, sec. 5, 1875. Weighing, sec. 17, 1875.	——
Leach, Thomas, Lee Wood, Bacup.	Lee - -	Brandwood Moor -	–	–	Edmund Whitworth.	22nd Aug. 1874	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	——
Lees, Ashworth, & Co. -	Syke - -	Littleborough, Manchester.	–	–	James Lees -	31st Oct. 1873 -	Boys, sec. 5. 1873. Weighing, sec. 17, 1873.	Record Plan of Mountain Mine sent to Home Office 1877.
Lees, Benj., and Joseph, Britannia, Bacup.	Freeholds - -	Shawforth - -	–	–	Benj. Lees -	17th Nov. 1873 -	Ditto ditto -	——
Lees and Mayall, Greenacres Moor, Oldham - -	Barrowshaw -	Barrowshaw -	–	–	John Kay -	31st June 1874 -	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	——
	Paulden - -	Ditto - -	–	–	Ditto -	4th Oct. 1875 -	Ditto ditto -	——
	Count Hill - -	Higher Barrowshaw	–	–	Ditto -	31st June 1874 -	Ditto ditto -	——
Lever Edge Coal Co., (Rothwell and Barlow) 388, Derby Street, Rumworth, Bolton.	Lever Edge - -	Great Lever -	–	–	James Rothwell.	6th Nov. 1873 -	Boys, sec. 5, 1873 for Half Yard and Three Quarters Mines.	——
Limehurst Colliery Co. (J. F. and A. Buckley).	Limehurst - -	Ashton-under-Lyne -	1	1	James Hughes	13th June 1874	Boys, sec. 5, 1872, for the Fairbottom and Foxhole Mines.	——
Little Harwood Colliery Co., Ld., 6, Bridge Street, Darwen.	Little Harwood -	Little Harwood -	–	–	—	28th Oct. 1874 -	——	Discontinued.
Lomax, Samuel, and Co. (Smallbridge Colliery Co.)	Smallbridge - -	Smallbridge, Rochdale.	–	–	Squire Brierley	2nd Mar. 1874 -	Boys, sec. 5, 1873. Weighing, sec. 17 1874.	——
Lomax, John, and Co., Rooley Moor Colliery, Rochdale - - - -	Greenland - -	Rooley Moor - -	–	–	—	21st Feb. 1874	Ditto ditto 1873	——
	Hunger Hill -	Ditto - -	–	–	James Lord -		Ditto ditto 1873	——
Lord, James, and Brother, Norden, Rochdale.	Bagslate Moor -	Norden - -	–	–	Charles Webster.	13th June 1874	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Lord, James - -	Blue Ball - -	Bacup - -	–	–	—	13th Dec. 1875 -	Weighing, sec. 17, 1878 -	——
Lord, John - -	Deansgreave - -	Ditto - -	–	–	—	1st Sept. 1874 -	Boys, sec. 5, 1875. Weighing, sec. 17, 1875.	——

List of Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Lord, Robert	Bamford Closes	Wolstenholme, Rochdale.	—	—	Richard Heys	24th Oct. 1874	Boys, sec. 5, 1875. Second outlet, sec. 22, sub-sec. C., 1878.	——
Lower Darwen Coal Co., Oswaldtwistle Colliery Office, Accrington.	Lower Darwen	Lower Darwen	—	—	George Howarth.	14th Mar. 1874. (Award.)	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	——
Maden, Henry & Co.	Hogshead	Britannia, Bacup	—	—	—	7th July 1874	Boys, sec. 5, 1873. Weighing, sec. 17, 1875.	Record Plan sent to Home Office 1876.
Maden, John, and Son	New Line	Bacup	—	—	—	17th Nov. 1873	Ditto ditto	——
Marland, James William, Robert, and Co.	Bower	Hollinwood, Manchester.	—	—	James Jackson	9th Mar. 1874. (Award.)	——	——
Marland, Robt. and James	Birches	Ashton-under-Lyne	—	—	—	3rd Oct. 1878	——	——
	Hartshead	Ditto	—	—	Wm. Taylor	9th Mar. 1874. (Award.)	Boys, sec. 5, 1872	——
Mayall, John	Lower Moor	Oldham	—	—	Hiram Robinson.	9th Mar. 1874. (Award.)	——	——
Meadow Head Colliery Co. (Collingwood and Co.)	Meadow Head	Wolstenholme, Rochdale.	—	—	Thomas Pickup	5th Nov. 1874	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	——
Mellodew, Thomas, & Co., Moorside, Oldham.	Sholver Lane	Moorside	—	—	—	24th July 1874.	Boys, sec. 5, 1873. Weighing, sec. 17, 1874.	S. Rules travelled from Sunfield.
	Sunfield	Ditto	—	—	—		Ditto ditto	——
Milnes, E. D., and Brother, Lumn Mills, Bury, Lanc.	Cobhouse Lane	Lumn, Birtle	—	—	John Hall	20th Oct. 1875	Boys, sec. 5, 1875. Weighing, sec. 17, 1875.	Record Plans sent to Home Office, Lark Mount 1876, Lumn, 1877.
Michell, Rev. Wm.	Heskin Hall	Heskin, Chorley	1	1	Wm. Beswicke	2nd Oct. 1873	Boys, sec. 5, 1872 Weighing, sec. 17, 1873.	——
Mills, Jos., and Brothers, Higher Change, Bacup.	Blue Ball	Bacup	—	—	—	5th Jan. 1875	——	Discontinued.
Moorside, Firebrick, Tile, and Coal Co., Ld.	Moorside	Ainsworth, Bolton	—	—	—	22nd Oct. 1873	——	——
Moscrop, J. & W.	Red Lumb	Wolstenholme, Rochdale.	—	—	—	13th June 1874	Boys, sec. 5, 1874. Weighing, sec. 17, 1875.	——
Moston Colliery Co., Ld. (Platt, Bros., & Co., Ld.)	Moston	Moston, Failsworth, Manchester.	—	—	Charles Cooke	14th March 1874 (Award.)	——	——

List of Coal Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Mountain Mine Coal Co., Ld.	Junction	Mossley Road, Ashton-under-Lyne.	–	–	Alfred Pearson	12th July 1876	—	—
Nightingale, Peter and Co.	Mesne Lea	Worsley, Manchester	–	–	Richard Unsworth.	14th March 1874. (Award.)	Weighing, sec. 17, 1874, for the Brassy Pit.	Record Plan of "Brassy Mine" sent to Home Office 1878.
Oldham, Middleton, and Rochdale Coal Co., Ld., Edge Lane, Oldham.	Bankhouse	Crompton	–	–	Joseph Sutcliffe	7th Mar. 1874. (Award.)	Boys, sec. 5, 1872	—
	Edge Lane	Ditto	–	–	—		—	—
	Gravel Hole	Rochdale	–	–	—		—	Abandoned. Record Plan, Crop Pit, sent to Home Office 1878.
	Hanging Chadder	Ditto	–	–	Joseph Wild		—	—
	Hartford	Oldham	–	–	George Wood		—	—
	Jubilee	Crompton	–	–	Joseph Fielding.		Boys, sec. 5, 1872	Mem.—Record Plan of Hopwood Colliery sent to Home Office 1876.
	Lee	Chadderton	–	–	George Wood		—	—
	Low Crompton	Ditto	–	–	Joseph Wild		—	—
	Robin Hill	Oldham	–	–	George Wood		—	—
	Royton	Royton	1	1	Joseph Wild		—	—
	Sholver	Crompton	–	–	Joseph Sutcliffe		—	—
	Woodside	Chadderton	–	–	—		—	—
Parke, Frederick	Withnell Fire-clay	Chorley	–	–	—	4th Oct. 1873	Weighing, sec. 17, 1873	—
Peake, Andrew	Wilderswood Fire-clay.	Horwich, Bolton	–	–	—	6th Sept. 1874	Weighing, sec. 17, 1874	—
Place, Joseph, and Sons	Hoddlesden	Hoddlesden, Darwen	–	–	Wm. Hy. Place	15th June 1874	Boys, sec. 5, 1873. Weighing, sec. 17, 1875.	—

List of Coal Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Platt Brothers, and Co., Ld., Oldham.	Brushes Clough -	Crompton, Oldham -	–	–	Robert Evans	15th Oct. 1873 -	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Priestley, Peter, Euxton Mill, Chorley, Lanc.	Bolton Green - -	Charnock-Richard -	–	–	—	—	——	Abandoned. Record Plan sent to Home Office 1877.
Rake Firebrick Co., Ld. -	Rake Pottery - -	Littleborough, Manchester.	–	–	—	13th Nov. 1873	Weighing, sec. 17, 1878 -	——
Ramsbottom, Thos., and Sons, Ld.	Birtle Dean -	Birtle, Bury, Lanc. -	–	–	—	14th Oct. 1873 -	Boys, sec. 5, 1873. Weighing, sec. 17, 1874.	Discontinued.
Ramsden, William, Shakerley Collieries, Tyldesley, Manchester.	Messhing Trees -	Tyldesley - -	–	–	Peter Howcroft	11th Mar. 1874 (Award.)	——	——
	Shakerley - -	Shakerley - -	–	–	Ditto -			
Ridge Hill Coal, Firebrick, and Tile Co., Ld., Stalybridge.	Ridge Hill - -	Stalybridge -	–	–	—	—	——	Discontinued.
Rochdale Property and General Finance Co., Ld., Drake Street, Rochdale.	Dearnley Fire-clay -	Littleborough, Manchester.	–	–	—	—	Weighing, sec. 17, 1878 -	——
Rocher Colliery Co., Ld., Parkbridge, Ashton-under-Lyne.	Hill - - -	Tannersfold, Park Bridge.	–	–	Lewis Jackson	13th June 1874.	——	Mem.—Record Plan of the "Bye and Hill" Pits sent to Home Office 1875, and of the Pickford Wood Pit 1877.
	Rocher - - -	Park Bridge -	–	–	Ditto -		——	
Roscoe, James, Little Hulton, Bolton.	Daisy Field - -	Tyldesley - -	–	–	Henry Worthington.	9th March 1874 (Award.)	——	——
	New Lester - -	Ditto - -	–	–	Ditto -			
	Peel Hall - -	Little Hulton -	–	–	Ditto -			
Roscow and Lord, Chadwick Hall, Rochdale.	Birtle - -	Birtle - -	–	–	John Scholes	13th June 1874 -	Boys, sec. 5, 1872. Weighing, sec. 17, 1874.	——
Roscow and Lord - -	Stonehill - -	Farnworth, Bolton -	–	–	David Mills -	13th June 1874	——	——
Sagar, Robert H., and Marshall, Simonstone, Burnley.	Hapton - -	Hapton - -	–	–	James Hargreaves.	2nd Dec. 1876	——	——
	Simonstone - -	Simonstone - -	–	–	Henry Sagar -	2nd Oct. 1873	——	——

List of Coal Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Scowcroft, Jethro, Tonge Colliery, Bolton.	Tonge Fold	Bolton	–	–	John Norris	25th Oct. 1873	——	——
	Tonge Moor	Ditto	–	–	Ditto			
Scowcroft, Samuel, and Sons, Rosehill Colliery, Bolton.	Rose Hill	Burnden	–	–	Noah Jones	14th March 1874. (Award.)	——	Mem.—Bradshaw Hall Colliery. Record Plan sent to Home Office 1875.
Scowcroft, Samuel, and Sons, Kersley Colliery, Kersley, Bolton.	Doe	Kersley	–	–	Joseph Wild		——	——
	Moss	Ditto	1	1	John Jones		——	——
Seddon, Thos. H.	Cow Lee Lane	Westhoughton, Bolton	–	–	Charles Wm. Dixon.	22nd Oct. 1873	Weighing, sec. 17, 1873	Record Plan of the Three-quarters Mine sent to Home Office 1877. Formerly John Seddon and Son.
Shaw and Hayes, Fire-clay Works, Thornlee, Lees, Manchester.	Lancashire and Yorkshire.	Thornlee	–	–	—	1st Dec. 1874	Weighing, sec. 17, 1874	——
Shepley, Edward	Higher Mill Fire-clay	Stalybridge	–	–	—	27th April 1878	Weighing, sec. 17,	——
Shorrock, Eccles, Brother and Co., New Mill, Darwen.	Entwistle Moss	Entwistle	–	–	—	—	——	Discontinued. Mem.—Record Plan of "Jack's Key" Pit sent to Home Office 1875.
	Winter Hill	Tockholes	–	–	—	—	——	Discontinued.
Simpson, Thomas, and Co., Oswaldtwistle Colliery Office, Church, Accrington.	Aspen	Oswaldtwistle	–	–	Joseph Thompson.	14th March 1874 (Award.)	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	——
	Belthorn	Ditto	–	–	George Yates		Ditto ditto	——
	Broadfield	Ditto	–	–	James Yates		Ditto ditto	——
	Red Walls	Ditto	–	–	—		Ditto ditto	——
	Stanhill	Ditto	–	–	Thomas Radcliffe.		Ditto ditto	——

List of Coal Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Smethurst, Hoyle, and Grime	Anderton Hall { Arley	Blackrod, Chorley	1	1	John Yates	14th Mar. 1874. (Award.)	—	Formerly Dewhurst, Hoyle, and Smethurst.
	Yard	Ditto	–	–	Patrick Mehers		Boys, sec. 5, 1872	—
Snydale Hall Colliery Co., Ld., Chequerbent, Bolton, (19, King Street, Wigan.)	Snydale Hall	Westhoughton, Bolton	–	–	John Sixsmith.		Boys, sec. 5, 1872, for Half Yard and Three-quarters Mines.	Record Plan of Half Yard Mine sent to Home Office 1875, and of Three-quarters Mine in 1876. Work resumed in Three-quarters Mine 1879.
Speakman, John, Exors. of, Broadfield Colliery, Westleigh, Leigh, Manchester.	Broadfield	Westleigh	–	–	Henry Cowburn.	4th Dec. 1873	—	—
Speakman, John, Westleigh, Leigh, Manchester.	Bankfield	Westleigh	–	–	—	—	—	—
	Bedford	Bedford	–	–	—	—	—	—
Springvale Coal, Coke, and Fire-clay Co., Ld., 62, Bolton Road, Darwen.	Taylor's Green	Sough	–	–	Thomas Taylor	13th June 1874	Boys, sec. 5, 1875. Weighing, sec. 17, 1875.	—
Stand Lane Colliery Co., Ld., Radcliffe, Manchester.	Stand Lane	Pilkington	2	2	John Banks	9th Mar. 1874 (Award.)	Weighing, sec. 17, 1873	—
	Springwell	Ditto	1	1	Ditto		Cover over head, G.R. 20 until 30th June 1879.	Special Rules travelled from Stand Lane Pits.
	Whitefield	Ditto	–	–	Richard Howarth.		Weighing, sec. 17, 1875	—
Stott, James, and Co.	Unity Brook	Kersley, Manchester	1	43	Isaiah Johnson		Weighing, sec. 17, 1873	—
Stott, William Rochdale	Ashworth	Ashworth	–	–	James Lees		Boys, sec. 5, 1872. Weighing, sec. 17, 1875.	—
	Dearnley	Smallbridge	–	–	Peter Boden		Ditto ditto	—
	Milnrow or Butterworth Hall.	Milnrow	–	–	Daniel Booth		Boys, sec. 5, 1872	—
	Tunsbill	Ditto	–	–	Ditto		Ditto	—
Stott, Samuel, and Co.	Hey Clough	Wardle, Rochdale	–	–	John Cheetham	8th Nov. 1873	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	—

List of Coal Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
Swainson and Co.	Lostock Valley Fire-clay Works.	Whittle-le-woods, Chorley.	–	–	—	21st Feb. 1877	——	——
Taylor, John, and Co., Hollingworth Colliery, Littleborough, Manchester.	Back o' Cleggs' Wood	Hollingworth	–	–	—	—	——	Discontinued.
	Hollingworth	Ditto	–	–	John Taylor	1st Oct. 1873	Boys, sec. 5, 1873. Weighing, sec. 17, 1874.	——
	Syke Lane	Ditto	–	–	Ditto	28th July 1874	Ditto ditto	Formerly Syke Lane Co., and before that James Brierley & Co.
Temperley, Thomas	Cloughhead Fire-clay	Sharneyford, Bacup	–	–	Thomas Temperley.	3rd Oct. 1873	Weighing, sec. 17, 1874	——
Tetlow, John, Summit Fire-clay Works, Littleborough, Manchester.	Lightowlers	Littleborough	–	–	Edward Kershaw.	4th July 1874	Weighing, sec. 17, 1875	——
Tetlow, John	Rawlinson Bridge Fire-clay.	Heath Charnock, Chorley.	–	–	John Kershaw	29th June 1874	Weighing, sec. 17, 1878	——
Townsend and Co., Greave Collieries, Bacup.	Britannia	Bacup	–	–	John Jackson	9th July 1874	Boys, sec. 5, 1872. Weighing, sec. 17, 1873.	——
	Greave	Ditto	–	–	Ditto	9th July 1874	Ditto ditto	——
Turton Moor Coal and Fire-clay Co., Egerton, Bolton.	Turton	Turton	–	–	—	—	——	Abandoned. Record Plan sent to Home Office 1878.
Tweedale Colliery Co. (Lomas Coupe), Norden, Rochdale.	Woodhouse Lane	Rochdale	–	–	John Coupe	26th Feb. 1877	Boys, sec. 5, 1878. Weighing, sec. 17, 1878.	——
Tweedale Samuel, Broadley Mills, Rochdale.	Tonnacliffe	Tonnacliffe	–	–	—	6th Aug. 1874	Boys, sec. 5, 1874. Weighing, sec. 17, 1874.	Discontinued.
Tweedale, Jacob and Sons	Healey Hall	Healey Hall, Rochdale	–	–	—	31st Oct. 1874	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	——
Tyldesley Coal Co., Ld., Tyldesley, Manchester.	Cleworth Hall	Shakerley	–	–	Henry Baxter	9th Mar. 1874 (Award.)	——	——
	Combermere	Tyldesley	–	–	Ditto			
	Shakerley	Shakerley	–	–	Ditto			
	Yew Tree	Tyldesley	–	–	Ditto			

List of Coal Mines, Managers, &c. in North and East Lancashire—*continued.*

Owner or Company.	Mine or Colliery.	Where situated.	Fatal Accidents.	Deaths.	Managers.	Special Rules Established. See Copy in Report for 1874, Signed.	Exemptions granted until further Order.	Remarks.
United Co-operative Coal Mining Society, Ld., Mortgagees of, 1, Balloon Street, Manchester.	Bugle Horn - -	Westhoughton -	–	–	Andrew Jackson.	14th March 1874. (Award.)	——	——
Waterside Fire clay Co. (Peter Balmer & Co.)	Waterside - -	Eccleshill - -	–	–	William Whewell.	18th July 1874	——	——
Westhoughton Coal and Cannel Co., Ld.	Westhoughton New -	Westhoughton, Bolton.	–	–	John Hutchinson.	20th June 1874	——	——
Wharton Hall Coal Co., Little Hulton, Bolton.	Wharton Hall -	Shakerley - -	–	–	James Beswick	13th June 1874	——	——
White, David - -	Boar-edge Fire-clay -	Bury, Lanc. - -	–	–	Richard Duckworth.	7th Sept. 1874.	——	——
Whittle, Thomas, Duxbury, Chorley.	Duxbury - -	Duxbury - -	–	–	John Sharples	16th July 1874 -	Boys, sec. 5, 1872, for Smith's Coal Mine. Weighing, sec. 17, 1873, for Smith's Coal Pit.	——
	Farnworth House -	Ditto - -	1	1	—	—	——	——
	Marklands - -	Blackrod - -	–	–	—	16th July 1874 -	Boys, sec. 5, 1872, for Bone Mine.	——
Wigan Coal and Iron Co., Ld., Wigan.	Hewlett - -	Westhoughton -	1	1	Charles G. Jackson.	9th March 1874. (Award.)	——	——
	Priestner's - -	Westleigh - -	2	2	Ditto -	4th Dec. 1873 -	——	Formerly Speakman's Hearts o' th' Meadow.
	Snapes - -	Ditto - -	–	–	Ditto -	4th Aug. 1874	——	——
	Westleigh 1, 2, 3, and 4.	Ditto - -	–	–	Ditto -	9th Mar. 1874. (Award.)	——	——
Willans, Thomas B., Rydings Mills, Rochdale.	Nutwood - -	Rydings, Wardle -	–	–	John Shore -	21st Oct. 1874 -	Boys, sec. 5, 1873. Weighing, sec. 17, 1873.	Record Plan of One Mine sent to Home Office 1875.
Williams, Edward - -	Bradford Fire-clay -	Bradford, Manchester	–	–	—	4th July 1874	——	——
Woods, William, and Son, Scot Lane Collieries, Wigan.	Scot Lane - -	Blackrod - -	–	–	John Unsworth	9th Mar. 1874	Boys, sec. 5, 1872, for Haigh Yard and Cannel Mines.	——
	Ditto Nos. 6, 7, and 8 pits.	Westhougton -	–	–	James Thompson.		——	——

This Plan to be placed opposite the Account of the Explosion at the end of Mr Dickinsons Report

TNITY BROOK COLLIERY.

CANNEL MINE.

Workings as existing on the 12th March 1878.

N
Upcast Shaft.
with a Ventilating Furnace
in the Trencherbone Mine
65 Yards above the Cannel. J.D.
Downcast Shaft
360 Yards to the Cannel. J.D.
Pit Level West
No 1 Level West
No 2 Level West
No 3 Level West
No 4 East Level West
No 1 East
No 2 East
No 3 East
No 4 East
Down Brow
Engine Plane
Screen
Doors
Door
Screen partly open
Sink of Rise 17 Yds
The pit Level west and No 1 Level west were the only parts of the pit found inaccessible from fire damp and after damp as soon as access could be had down the shafts after the explosion. All the other parts were found accessible even with all the doors, screens, &c blown away. The men were found dead. J.D.
These men had apparently come away when the roof commenced falling, and the fire damp would light at their open lights. The roof had been on the move during the morning, but unfortunately the men were not withdrawn. J.D.
These men had also, apparently come out the way of the fall. J.D
Scale of Yards
0 20 40 60 80 100 120 140 160

James Atherton,
Mining Engineer.
Bolton 18th March 1878.

With Notes by J. Dickinson.

Burnt cases marked	B	
Badly burnt cases marked	B B	
Do and bruised	B B B	

No.			
1	Alfred Isherwood	B	
2	William Leach	B B	
3	James Byrom	B	
4	George Lindley	B B	
5	Thomas Byrom	B B	
6	Ellis Lord Lindley	B	
7	John Tickle Lomax	B	
8	William Morris	B B	
9	John Hamblet	B B	
10	John Harrison	B	
11	George Jackson	B	
12	Charles Ting	B B	
13	James Lomax	B B	
14	Richard Featherstone	B	
15	Thomas Mace	B B	
16	Robert Clarke	B	
17	Joseph Welsby	B	
18	Richard Wallwork	B B	
19	John Greenhalgh	B. B	
20	Peter Fogg	B	
21	James Partington	B	
22	James Hobson	B B	
23	Joseph Hobson	B B	
24	James Chadwick	B	
25	Robert Entwen	B B	
26	David Entwen	B B	
27	Samuel Webstenholme	B B & B	
28	William Webstenholme	B. B.	
29	Thomas Lever	B B	
30	Absalom Barnes	B	
31	Andrew Walker	B B	
32	William Barnes	B B	
33	[illegible] Lomax	B	
34	Thomas Lomax	B	
35	George Booth	B B	
36	Thomas Webstenholme	B B	
37	John Haynes	B	
38	Christopher Moore	B	
39	James Beattie	B	
40	Jonathan Entwen	Missing	
41	Thomas Peake	D	
42	William Mayoh	D	
43	Thomas Holden	D	

Explosion in Unity Brook Colliery, 12th March 1878.

The explosion in Unity Brook Colliery, Kersley, near Manchester, by which 43 lives were lost, occurred at 10 minutes past 1 o'clock noon, on the 12th March 1878. Two seams of coal were being worked. The depth to the upper seam, called the Trencherbone, being about 300 yards; and to the lower, called the Cannel, about 360 yards. There were two shafts, with a winding engine at each, the downcast being the ordinary winding shaft for both seams. The workings were of small extent; the length on the level course being only about 350 yards, and the breadth from rise to dip about 200 yards. The dip was at the rate of about one in four, and the workings were on the dip of the shafts. Open lights were used in working both seams. Safety lamps being only used for examinations. The explosion took place in the lower or Cannel Mine. The workings in it as shown on the accompanying plan were divided into east and west sides by an engine plane or downbrow. There were five levels at each side, each of which had been driven out to the boundary, where the cut throughs were all completed from one level to another, and the pillars commenced to be worked back towards the shafts.

It appeared that in the pillar work at the east side a sink of ground and fall of roof took place about a month before the explosion, but not any such fall or sink had occurred at the west side. Early in the morning of the day of the explosion Mr. James Holt, the under-looker, on going his round as fireman in that mine before the men came down, found a little roof fallen in the west pillar work. But in other respects things were as usual. In the course of the morning he was called back to this fall by his assistant, William Mayoh. On returning he found the fall considerably increased, it having come down 3 or 4 feet in thickness over an area of about 10 yards by 7, and the roof was still settling down upon the gob walling which had been built for its support. Like most experienced miners accustomed to fire-damp, he was aware of the old rule and practice in this district that when roof is falling or likely to fall, especially if it be the first fall of roof in that part of the workings, open lights shall be excluded; but apparently it neither occurred to him, nor to any of the other experienced colliers at the place, that this being the first break in the roof in this part of the workings was just the kind of fall most likely to be accompanied by an issue of fire-damp. He went on the top of what had fallen and found good air passing, and having arranged with his assistant to set a strong prop under one part, he went away to other duties, leaving the men at work with naked candles. Having finished in the Cannel Mine he went up into the Trencherbone, and after being there an hour or two he went up to the surface. It was then 1 o'clock. His usual time for coming up was an hour or two later, but the manager, Mr. Isaiah Johnson, being away that day on colliery business, he had to see to affairs on the surface. On entering the cage to come up the shaft from the Trencherbone mouthing he found a miner in it named Ralph Welsby, who was coming out from the east side of the Cannel Mine. It was also before Welsby's usual time for coming out, but that had apparently no signification, as he had arranged beforehand to visit a sick child. Ten minutes afterwards the explosion took place. All left in the Cannel Mine, 42 in number, and the onsetter at the Trencherbone mouthing, lost their lives. Both shafts were disarranged, some of the brick casing being blown out, timber broken, and landing plates torn up. One of the cages of the downcast shaft was at the top and the other at the Cannel at the time. The one at the top was not much damaged, as the blast there got vent through an opening underneath. No time was lost in roughly re-arranging things, and the rope that was down the shaft being fast was slung and disconnected. Holt then accompanied by two men named Teesdale went carefully down. They descended to within about 5 yards of the Trencherbone mouthing, when the further descent of the cage was stopped by *débris* in the shaft. Holt then got out and by climbing down the conducting ropes reached the Trencherbone mouthing and there found men alive.

At the time of the occurrence I happened to be engaged on office duties and was enabled in response to a telegram to reach the colliery at about 3 p.m., or within two hours after the explosion. I found that an iron hoppet had been substituted for the cage in order to pass the *débris* in the shaft, and by this means Holt was bringing men up from the Trencherbone. The air coming out of the upcast shaft was strongly admixed with after-damp, but there was no smell indicative of the mine being on fire. Fresh air was drawing down the downcast, but the men as they came up smelt strongly of after-damp, and some appeared to be suffering from the effects of it. They stated that they had heard no sign of life from the Cannel Mine, and that the fresh air only descended to the Trencherbone where it became mixed with suffocating after-damp which was coming up from the Cannel. Some mining engineers from neighbouring collieries had arrived, including Mr. Edward Pilkington and Mr. Simon Horrocks. We held a brief consultation on the pit bank, as to the after-damp in the down-

cast shaft, and quickly decided to continue getting out all who were known to be alive before making any change, lest all might be lost. These men, about 30 in number, having been got up from the Trencherbone, I then descended the shaft with Holt, he being the only person there in authority, to see if anything could be done for the men in the Cannel. We took with us two buckets of water to dash down and reverse the current in the event of finding it hovering on the balance or upcasting from the Cannel. On arriving at the Trencherbone we found the current had resumed its ordinary course and was downcasting. Had it been as reported by the men, it might have been serious for us as in consequence of the indicator on the winding engine not being accurately arranged to the hastily extemporised winding arrangements, and there being no one left down to signal the engineman to stop, the hoppet was lowered a few feet below the mouthing. On being raised to the mouthing we looked about for the missing onsetter, but without finding him. We saw that the main air doors were right and the furnace fire out, and then made the attempt to reach the Cannel, but found the pit so choked with timber and other rubbish as to need the aid of workmen to clear it away; and having shouted down the shaft without receiving any reply we returned o the surface and sent down the pit carpenters. In an hour's time they returned bringing with them the dead body of the onsetter which they had found amongst the rubbish in the shaft. Five hours had now elapsed since the explosion. Holt, myself, Mr. Woodward, and Mr. Grimshaw then entered the hoppet and descended, and creeping down among the rubbish in the bottom, avoiding contact with the shattered surroundings, we got into the Cannel Mine. The place was hot, with some after-damp which smelt strongly and affected the eyes, but which was apparently sufficiently admixed with air to be respirable. We first tried to go along the upper west level leading to where the roof had been falling in the morning, but the after-damp and fire-damp was too strong to admit of our going many yards. Leaving this we went down the engine brow, passing amongst considerable destruction, and went through the other parts of the mine as quickly as possible. All the men we came upon were dead. Their bodies were all burned and some of them badly injured, nearly all apparently lying where they had been first struck by the blast. The air doors and screens were blown away, yet without replacing a single one, or doing anything to restore ventilation, we got into all the workings except the inner parts of the two upper west levels. On getting to the lower side of where the ground had been falling in the morning we found an extensive fall, which was still falling a little. Having thus ascertained that no further life remained to be rescued we returned to the shaft. It was then about 8 p.m., or seven hours after the explosion, the exploration of the Cannel Mine having occupied us about two hours. That time, although short for such work, had appeared long to friends on the surface, anxious to know the result or to lend assistance. The manager also having returned, had with Mr. Martin and others descended to the Trencherbone, and Mr. James Stott, the managing partner, had come. To these and others deeply interested we communicated our sad news. I then, having first assisted in arranging what should be further done for the safety of those to be employed in temporarily restoring the ventilation and bringing out the bodies, returned home, leaving the colliery officials to carry on the work.

Next afternoon I again visited the pit. The upcast shaft had been explored and found damaged like the downcast, and the bottom nearly choked with rubbish, which had either fallen or been blown there. Such of the rubbish as materially obstructed the ventilation or made the required passage unsafe had been cleared away, and temporary screens put up to send the air current to the far ends, and all the bodies except three, which were afterwards found under the rubbish in the sump hole, had been carried to the shaft, and were being sent up in the hoppet. The fall in the west pillar work could now be reached and examined at the higher side as well as the lower. It now extended about 25 yards by 20, being about seven times the area it was when Holt left it before the explosion, and had fallen from several feet in height. The termination of it at the higher side was a small slip, as smooth as glass, but which only extended a few feet up and then cased, the fallen part beyond having broken from ordinary roof stone. Fire-damp was issuing freely out of the cavity into the air current underneath. The mine almost throughout was coated with dust, and near the fall there was a deposit of soot. The fall was the centre from which the blast radiated. Timber, trams, air screens, and all the air doors, except two in the top level at the east side of the downcast shaft, where the blast had got vent up the shafts, were driven from this fall. Flame had apparently travelled with the blast all over the workings, and it seemed that either two currents had clashed together near the fall in the east side pillar work, or a little extra gas had been sucked out.

Afterwards, on the 18th March and 2nd May, when I was again in the pit, fire-damp was still issuing at the western fall, but in decreased quantity.

On the 15th January 1879, and on the anniversary of the explosion when I, again visited

the pit, the pillaring had advanced about 100 yards from the fall, and fire-damp was still issuing at the explosive point from the fresh breaks. The issue of gas from the roof of the mine is therefore beyond any doubt.

At the inquest held by Mr. Coroner J. Broughton Edge, the evidence showed that for six months prior to the explosion no accumulated fire-damp had been found in the mine; the latest appearance being on the 22nd September, which was before the cut throughs between the levels had been completed at the far ends. The bodies of all the miners who worked near the fall were found out of their places of work, as though they had either not returned after being out for dinner or had come out consequent upon finding the roof to be on the move. In either case, probably lighted candles would not be left in the places which would admit of a large space between them and the fall to become filled with an admixture of gas before coming in contact with any candle, and thus account for the violence of the explosion. The underlooker and the collier who came out of the pit with him 10 minutes before the explosion testified to the air being all right when they left; and a large number of others including relatives of the deceased spoke as to the general safety of the mine. The only risk mentioned by any of them was from falls of coal and dirt, which are at times unavoidable in working, particularly in steep and jointy seams like these. One old miner stated that the air in the mine was as fresh as on the turnpike road, and when questioned about not using safety lamps to work with, maintained (as did others also,) that considering the various kinds of accidents to be guarded against it was safer on the average to work a mine like this with open lights. There had been no pinching in the airways. The engine plane was between 7 and 8 feet wide and 4 feet 4 inches high, each level and airway being that height and 6 feet wide, with larger spaces at the pillaring. The air was divided into two main currents or splits, one ventilating the east and the other the west side, with a ventilating furnace in the Trencherbone Mine. Measurements of air are frequently unreliable even when taken with great care; however, they showed that in the Cannel Mine 16,000 cubic feet of air was passing per minute, which was declared ample for these small workings. The only conclusion, therefore, that could be arrived at was that the explosion occurred from an outburst of fire-damp accompanying the first main break of the roof in the west workings.

Safety lamps are now used in both seams, although against the expressed wish of many of the miners who have to undergo the risks. Their fear is that with the poor light of the Davy lamp more accidents will happen from falls of roof and coal. Possibly, however, if safety lamps had been in use, especially self-extinguishing lamps in an explosive mixture, the explosion might have been avoided. But inasmuch as open lights were in use, the great error of judgment was in not excluding them when the first break of roof was occurring. This omission is the more remarkable as in the succeeding difficulties attending the rescue of the men from the upper seam, and the exploration in the lower, the underlooker in charge showed himself to be possessed of practical knowledge and presence of mind.

Twelve years ago, on the 10th December 1866, a similar outburst of fire-damp accompanying a first break of roof occurred in the same seam of coal at the Bank Colliery, Little Hulton, when 8 lives were lost and 14 others, including the underlooker and fireman, were burned. On that occasion only safety lamps were allowed to be used, but some of the miners thinking that precaution unnecessary had opened them.

I have, &c.,
JOSEPH DICKINSON.

To the Right Hon. R. A. Cross, M.P.,
H.M. Principal Secretary of State,
Home Department, Whitehall.

Report of Assistant Inspector.

Park Villas, Prestwich,
Manchester, 24th March 1879.

Sir,

I have the honour to report that during the past year I have exercised the duties of Inspector in the district of North and East Lancashire under the Coal Mines Regulation Act, 1872, and in Cheshire, Sussex, and North and East Lancashire, exclusive of the detached part of North Lancashire, under the Metalliferous Mines Regulation Act, 1872 and 1875, also in Ireland under each of the Acts, and that in so doing I have acted as assistant to and under the directions of Mr. Dickinson.

I have, &c.,
JOSEPH S. MARTIN.

To the Right Hon. R. A. Cross, M.P.,
H.M. Principal Secretary of State,
Home Department, Whitehall.

Mr. Wynne's Report.

REPORT on the INSPECTION OF MINES for the DISTRICT comprising NORTH STAFFORDSHIRE, CHESHIRE, and SHROPSHIRE, for the Year ended 31st December 1878.

The Manor House, Gnosall, Stafford.
March 20th, 1879.

SIR,

I HAVE the honour to report to you my proceedings as Inspector of Mines for the above district, and at the same time to call attention to the causes that led to this lamentable loss of life and to point out, as well as I can, the most likely means of avoiding these sad accidents for the future.

The total number of fatal accidents are 48, which is 1 to every 512 persons employed, and 1 to every 163,434 tons of mineral raised, but this favourable comparison, as regards fatal accidents has its reverse when we come to consider the effect of these accidents as the deaths amount to 75; the increase being chiefly due to explosions causing the loss of 28 lives by 3 accidents of this kind.

Explosions of Fire-damp.

Have been 3 in number, but terribly fatal, the loss of life being respectively 23, 3, and 2=28. On the 27th March the Apedale Explosion occurred, by which 23 lives were lost, entailing great distress of mind by the delay in the recovery of the bodies, and an immense sacrifice of property to the owners; but to their credit it should be stated that, beyond the allowance from the Hartley Fund, they have themselves provided for the widows and orphans without any extraneous help, and they have now completed and set to work the very powerful Guibal fan that had been ordered previous to the sad catastrophe which it is now my painful duty to record.

With the able assistance of Mr. Maule, Q.C., the whole facts of the case were clearly brought out, and with the plan of the workings to refer to, the following evidence will be pretty well understood:—

THE APEDALE COLLIERY EXPLOSION.

The Inquest.

An inquest on the bodies of the 23 men killed by the explosion of gas at the Burley Pit of the Apedale Colliery, which took place on the 27th March last, was resumed on Tuesday, at the George and Dragon Hotel, Chesterton, before Mr. Booth, coroner.

The names of the deceased are:

Caleb Whalley (29), Apedale.
Frederick Whalley (13) „
John Hackin (16), Silverdale.
Edward Smith (32) „
William Bostock (15) „
Joseph Braddock (28) „
William Baggalley (14) „
James Higginson (35) „
Thomas Dale (20) „
Henry Yarwood (17) „
John Sanders (26) „
John Edwards (28) „
John Stockton (15), Silverdale.
William Baggalley (25) „
Albert Handy (15) „
Henry Piper (28), Halmerend.
Abraham Riley (43), Boon Hill.
John Taylor (16), Newcastle.
Joseph Baggalley (35) „
James Mayer (60), Chesterton.
Thomas Hughes (28) „
Richard Fowler (60) „
James Cork (21), Wood Lane.

Mr. Maule, Q.C., watched the proceedings on behalf of the Treasury; and Mr. Wynne and Mr. Gilroy, Government inspectors of mines, were also present. Messrs. T. J. Udall and J. Strick represented the company of Messrs. Stanier and Co., proprietors of the colliery; Mr. W. Brown (miners' agent), was also present.

The Coroner briefly reminded the jury of the purpose of the inquiry, and, without going into details, called

Mr. James Cope Cadman, mining surveyor, in the employ of Messrs. Stanier at Apedale, who produced plans he had prepared of the Burley Pit. The several seams were marked as the Bullhurst

APEDALE COLLIERY

BURLEY PIT

EIGHT FEET COAL

Explanations

Eight feet Coal workings Colored thus

Air Current

Stoppings

Brattices or Quids

Air Pipes

Regulator R

Doors D

Black Numbers shew each Mans Working Place

Red Numbers shew when the Dead were found

Numbers and Names of the Dead

N° 1	John Sanders	Collier
„ 2	James Cork	Leader & Waggoner
„ 3	John Steeksten	Rudder
„ 4	Thomas Dale	Collier
	John Edwards	Collier
„ 6	Joseph Braddock	Collier.
„ 7	John Hacking	Braker.
	8 William Baggaley	Leader
	9 Henry Wetwood	Farmer
„ 10	John Taylor	Waggoner & Braker
„ 11	William Bestock	Waggoner & Braker
„ 12	Abraham Riley	Air Road man
„ 13	Henry Piper	„ do do
„ 14	James Higginsen	Fireman
„ 15	Thomas Hughes	Collier
„ 16	James Mayer	Rudder
„ 17	Joseph Baggaley	Collier
„ 18	Richard Fowler	Air Furnace man
„ 19	Caleb Whalley	Over looker
„ 20	Fred Whalley	Rudder
„ 21	William Baggaley	Horse driver
„ 22	Edward Smith	Fireman
„ 23	Albert Heaton	Waggoner

Thomas Wynne

Coal Inspector of Mines

North Staffordshire District

8-ft., 7-ft., and 10-ft., and he explained the various features of the plans. The depth of the shaft was 484 yards. Witness gave further scientific evidence, and explained several points in relation to the seams.

John Whalley, fireman in the 7-ft. seam of the Burley Pit prior to the accident, said: That he was at work at the time of the explosion, which took place at about 20 minutes to two, and was in the south level. He felt an effect from it in his head, and afterwards heard it. There were several men working with him, and they all came up at once. About an hour and a half after the accident he went down again, but did not go into the workings. The seams were entirely distinct, and were worked separately. It was the custom in the whole of the seams to use lamps exclusively, and the head butty tried all of the lamps every morning. Witness saw this done on the day of the accident. It was customary for the fireman to go down the pit every morning at a quarter past five to examine the workings. On the morning of the explosion witness examined his workings, and found no gas at all. The fireman of the 8-ft. seam went down about the usual time. During the day he made several examinations, but found no traces of gas. The fireman had to be present to examine the shot, and ascertain if there was any gas. If they found it free from gas, permission was sometimes given to the man to fire his own shot. About three shots were fired in his end of the 7-ft. seam during the day of the explosion. As a rule the places were found free from gas, but if any were found, steps were taken for its removal before the men came down. Witness had worked over 20 years in coal pits, and he was of opinion that the Burley Pit was the best he had ever known as being free from gas. It was also well conducted in other respects.

Mr. Maule.—You tell us you went down to the workings about half an hour after the explosion occurred. Did you do anything after you got out of the cage at the bottom of the shaft?—No; I was told that there were plenty of men in the workings, and no additional assistance was required, therefore I went up again.

Mr. Maule.—Did you notice anything on that occasion whilst at the bottom of the shaft?—Nothing particular.

The Corner.—I suppose at the same pit you are not drifting in the mine at present; merely opening out?—Just so, sir.

Mr. Gilroy.—Were the shots always fired in the fireman's presence, when he gave permission for the workmen to fire them?—Yes.

Mr. Gilroy.—Is that a strict rule?—Yes; the rule laid down by the manager.

John Shenton, head butty at the Burley Pit, said: That his duty was to thoroughly examine all lamps before they were taken into the workings. He saw that the lamps were in good order, as well as locked. No one was allowed to have a key except the fireman. He examined the lamps as usual on the morning of the explosion. A short time before the accident he was down in the pit and chatting with Caleb Whalley. He heard no complaint at that time about the state of the workings, which he knew were almost always free from gas. He would have been sure to have heard had there been anything wrong about them. He had been accustomed to fiery seams of coal ever since he was a boy, and never knew one better kept than those in the Burley Pit. He had heard complaints of there being too much, but never too little, air. He knew that in one case, about 12 months since, a man endeavoured to check the flow of air, and was fined for so doing. Witness was in the pit at the time of the explosion, but not in the same seam, and was rendered insensible by the shock.—In reply to Mr. Maule, Q.C., witness said that he explored the pit after the accident, remaining down all the afternoon. He noticed that on the north side a lot of dirt and timber had been knocked towards the shaft. On the south side several timbers had been blown down, and there was some fire burning. It was not severe, and they put it out. In consequence of further fire being discovered the men were withdrawn.

Henry Viggers, at present a railway porter, but who was working in the Burley Pit at the time of the accident said: That he was working in the 8-ft. seam the Saturday before the accident. The workings were then free from gas, and there was plenty of air. He was working for 15 months prior to the explosion, and during the whole of that time they were quite free from gas. He had never found any gas in the working places, nor had he ever heard any complaints of shortness of air. He had been a collier all his life, and never knew a mine so well conducted as the Burley Pit. He was the only man living out of the company who had worked in the seam. He was astounded when he heard of the accident, and thought it must be a mistake. He always considered himself safe from an explosion when working there. It was a common thing for the colliers to make periodical examinations of their workings, and they never found any gas present.

John Dale, a collier, who had worked for two years at the Burley Pit, and had left about a month prior to the explosion, was the next witness. He said that for about four months he was fireman in the 8-ft. seam. He never saw anything to complain of with regard to the air. There was often a good deal of grumbling by the men because there was too much air. He had been working in collieries for years, and never had any cause to find fault with anything at the pit. He was astonished when he heard of the accident, and no thought of accident ever occurred to him.

Mr. James Henry Price, certificated manager at the colliery, said: That the Burley Pit was laid out partly under his direction. He had been certificated manager for two years and a half, and prior to that he had acted as Mr. Bostock's (the late manager) assistant. There were two shafts, and ventilation was effected by means of a furnace drawing from 90 to 100,000 cb. feet per minute. The furnace was frequently tested, but the book showing the results was down the pit and destroyed. About 23,000 cb. feet of air per minute was used for the 10-ft. seam, 25,000 cb. feet to 26,000 cb. feet for the 7-ft., and 23,000 cb. feet to 25,000 for the 8-ft. A fan was in contemplation, and the first part of the machinery for it came the very day after the explosion. He was in the habit of visiting the pit as often as required, sometimes once, sometimes two or three times a week. He was last in the 8-ft. seam on the 20th March. He had no special reason for going down the pit on that day. He found everything satisfactory.

Caleb Whalley was his underlooker, and assisted him in trying the air. He found all the workings free from gas. Witness explained by means of diagrams and sectional drawings the various methods of ventilation. He produced report books which were examined by the Coroner.

In answer to Mr. Wynne, witness said that it might be possible for the furnace flames to get up high enough to ignite the return air, and gave further explanation of the system of ventilation in use in the pit.

Frederick Cook, lamp-man, said that he gave out the lamps on the morning of the explosion, finishing at about six o'clock. He gave out about 94 altogether, but had no account of how many went into each seam. They were all in good condition, and locked.

Thomas Moore, lamp-man, said 69 lamps were returned to him. All were in good condition and locked. All his lamps had been returned with the exception of 12. The 11 lamps recovered from the 8-ft. seam were produced, all of which were more or less damaged.

In reply to Mr. Gilroy, witness said that the colliers always left their match boxes and pipes with him before they went down. Slips of paper were used to show which lamp every man had and they could not be changed without the fact being known.

William Scott, assistant certificated manager at the Apedale Collieries, said that the Burley Pit was not in his charge, but that he occasionally went down. After the explosion he was one of the first to go down the pit. They went to the south side and found a small fire, which they extinguished. Coal and timber were found on fire, but no brattice.

Cross-examined by Mr. Wynne.—Did you see anything that led you to form an opinion as to the cause of the accident?—Witness: I did.

What was that?—I examined all the workings and went down the air dip, where there were traces of fire. I found places where the coal had been on fire, and the inference I drew was that the air was fired at the furnace and tailed up.

Did you find any trace of a shot that had been fired?—Yes, on the 6th June.

Did you draw any inference with regard to it?—No.

In answer to further questions, witness said that about two tons of coals had dropped down. The coal was coked about the third, fourth, and fifth thirlings. He pointed out on the plan, and when asked why the force of the fire seemed to be so much stronger at a distance from the place at which it originated, replied that it always got force as it proceeded until it got to its limit.—In reply to the Coroner he said he had been accustomed to explosions. The greatest amount of damage was, in his opinion, done by the first explosion.

Mr. James Lucas said: That at the time of the accident he was acting as manager for Messrs. Stanier at the Silverdale Colliery. He had been down the Burley Pit with the exploring party and once with Mr. Stanier. From the charred condition of the coal in certain places he was led to think that the explosion occurred where a shot had been fired about 40 yards up the dip, on a level with the furnace. The seam was very dusty, and the dust would catch fire before the gas. It would be possible for the gas to have accumulated owing to a door having been left open. He could not positively say whether the fire was due to the furnace or the shot. The shot had done its work. The workings in which the explosion occurred were efficiently ventilated, and it would be almost impossible for gas to collect unless a door had been left open.

At this point the inquiry was adjourned.

The inquiry was concluded on Wednesday morning, Mr. Maule, Q.C., and Messr. Wynne and Gilroy (Government inspectors of mines) being again present, as was also Mr. Brown, on behalf of the colliers.

The first witness examined was *Mr. Strick*, who said he was general manager of the Silverdale and Apedale Collieries. He visited the Burley Pit after the explosion, on the 6th, 10th, 12th, and 16th July, the Government Inspectors of Mines accompanying him on the 12th. He visited the dips as far as the place where the explosion occurred. From the examinations made he was of opinion that the explosion occurred at the furnace. All the evidences, and traces of the fire seemed to start from the point between the furnace and the place where the shot was fired, and the heaviest places of the fire was along the "crut," in a straight line from the furnace dip. He considered the greatest force of the explosion was felt in the vicinity of the furnace, and that was the reason of the men being blown on to the top of it.—In answer to the Coroner, he said that he considered 23,000 feet of air, supplied by means of the furnaces, would be sufficient for the whole of the workings in the 8-ft. seam, in which the explosion occurred. Taking the whole of the workings, as far as he saw, he thought they were properly and skilfully constructed and carried out; but if he had laid them out himself he certainly should not have constructed them to cause the return air to come in the direction it did. According to the present plans the whole of the foul air from the mine generally would return over the furnace, a method he did not exactly approve of. He thought that if the furnace and its surroundings had been so constructed as to cause the return foul air from the Bullhurst Seam to pass over the furnace without coming in contact with the flame of the furnace, he should in all other respects approve of the plans and system of the workings.

Mr. S. B. Gilroy, inspector of mines, was next examined at some length. He stated that on March 27th he received a telegram concerning the explosion, and at once proceeded to the scene of the disaster. The last exploring party returned to the surface immediately after his arrival, and reported that fire was smelt in the south side workings, and the curbs in the up-cast shaft were on fire, the limits of their explorations being fixed by the after-damp, and consequently leaving no doubt as to the death of the men in the workings. A consultation took place, when it was considered useless to run further risk of life by sending men down the shaft. Witness then advised the flooding of the mine to quench the fire. The managers in charge replied that there was not sufficient water to do that, so

that the next best thing was done, and that was to cast down some rubbish to plug the bottom of the up-cast shaft, and thereby cut off the supply of air which was then every moment increasing and spreading the fire. Witness did not leave the pit that night, Mr. Price, the manager, staying with him. About noon on the following day it was considered that the communication between the shafts was cut off, when a second explosion took place, which settled the question as to a further descent of the mine, which certain well-meaning, but foolhardy, persons were contemplating. Exploration being abandoned, steam pumps and other appliances were at once put into operation, and the flooding of the mine carried out. Witness went down the mine on the 7th June, and made an examination, and proceeded about 80 yards up the furnace drift. At that point the gas was then very strong, and the party were compelled to proceed with the greatest caution, so as not to displace the standing gas too rapidly. On the 12th July he made a further examination of the mine, and at one place found that the roof had fallen in about 20 yards, and in another place the coal was "coked" on both sides, indicating the fire in this particular place to have been very severe, and a thermometer there registered 86°. He also found marks of a shot in the back furnace dip, and the inference was that this shot was fired immediately before the explosion, but he would not put it forward as his opinion that the firing of this shot ignited the gas, inasmuch as there were other suppositions, but he would lay stress upon the fact that the only man within some distance of the spot authorised to fire a shot was Caleb Whalley, and the body of the collier who would have prepared that shot was found within 30 yards of it, and his jacket, which had been burnt, was found close to the shot. He could not say what was actually the cause of the explosion; various reasons might be assigned. The first reason might have been the shot in the back furnace dip. The second reason would be the supposed ignition of the return air from the 10-ft. seam, which was carried, in conjunction with the return from the Bullhurst Seam, over the ventilating furnace, and which was in work that morning, and had the character of yielding as much gas as any mine in the district. Another reason for the explosion might be found in a supposed defective lamp, or in any other risk to which miners were habitually subjected. Traces of fire were found also on the north side, which made the matter very puzzling; and altogether witness never met with a case where the traces of an explosion were so contradictory and perplexing as in the present one. This fire might be accounted for by the two places on this side where the coal was burnt marking the points of the recoil of the flame, which, travelling more slowly, would burn more fiercely. It was more difficult to account for the quantity of gas than for the means of igniting it. It was witness' opinion that the pit was a very fairly conducted one, though he had at different times called attention to the fundamental error of allowing the return air to pass through the furnace; inasmuch as the gas was never found in any quantity, and as the amount of ventilation was calculated to render it harmless long before reaching the furnace, he did not consider it in his province to interfere.—*By Mr. Maule.*—A shot which does its work is equally dangerous with any other if the gas is near enough to ignite. *Mr. Maule.*—Do you suppose it was caused by the firing of the return air, or by the firing of the superabundent gas in the seam?—I think it is most probable, from the two theories put forward, that I should give the weight of the argument to the shot. If the shot fired the gas I should not expect to find the greatest force of the explosion near the shot. Experiments of a very conclusive character have been made in South Lancashire by a mines' inspector, which prove that coal dust has the effect of very considerably augmenting the force and extent of the explosion.

Mr. Wynne, inspector of mines, stated: That on the 12th of July he was enabled to make such an inspection of the mine as to enable him to form a pretty accurate opinion as to the cause of the explosion, and although others may have a different opinion to his, it was quite clear to him that the gas fired at the furnace, and that the return air which passed over the fire had become foul at the time. It would be seen from the plan, that the air from the 10-ft. seam, and also from the Bullhurst Mine, was brought through a "staple" put into the 8-ft. level, where it joined the other, and together passed over the furnace fire; and it appears that a few days previously a "thirling" was made out of the straight rise heading into the workings above, so that any gas that was given off in the higher workings had then a straight run to the furnace, instead of having, as before, to travel some distance round and have time to mix with the other returns before reaching the furnace. "It also appears that the door was "put in near this 'cut through,' and at the very time of the explosion some further alteration was being "made at the spot, and although these changes would no doubt improve the ventilation in the upper "workings, it was a grave mistake to make a material change in the return air courses until the fan was "erected and the furnace abandoned, as a slight increase in the quantity of gases either from the 'small "blower' or from the 'fault,' would necessarily float directly on to the fire and cause an explosion. From "the position in which the coal getters' clothes and tools were found, there can be but little doubt that "a shot had just been fired in the return air course, and the general opinion at first was that the gas had "fired at that shot; but however reprehensible it was to fire a shot in such a place, all appearances "when I saw it were decidedly against the theory, for the whole force of the explosion took the direction "from the pit and not towards it, and past the place where the shot was fired. When this colliery was "laid out it seems to have escaped the attention of the manager that the rise workings would be 170 "yards higher than the bottom of the shaft, and consequently would require a strong pull in the "up-cast shaft to bring warm air and gas down to the level; but experience having taught him that "lesson, a very powerful Guibal fan was ordered, and the foundations were actually commenced "before this calamity happened, and will soon be at work, when they will have the command of any "amount of air, and be able to ventilate the whole of the seams worked in these pits."

The Coroner said this was the whole of the evidence he intended to bring forward, and after briefly reviewing the chief features of the testimony of the various witnesses, he asked the jury to retire to consider their verdict.

About half-past two o'clock, after returning from consultation, the jury brought in the following

verdict: "That the men lost their lives through an explosion of gas, but how and where it accumulated, or where it exploded, we have no positive evidence to show. We find also that there does not appear to be any blame to be attached to the management of the pit."

Upon the evidence being brought to your notice by Mr. Maule and myself it was considered by you a proper case for inquiry under the 32nd section of the Coal Mines Regulation Act, whether, the then manager, James Henry Price, was a fit and proper person to hold a certificate of competency under the said Act. The case was very clearly and fairly stated by Mr. Booth, solicitor of Tunstall, as all who read it will admit.

THE COAL MINES REGULATION ACT.

IN the matter of an inquiry into the conduct of JAMES HENRY PRICE, of Chesterton, in the county of Stafford, a person holding a certificate as manager of a colliery under the said Coal Mines Regulation Act.

Before WILLIAM SPOONER, Esq., County Court Judge, and THOMAS EVANS, Esq., as Assessor.

Statement of Case upon which the inquiry is instituted.

The inquiry is instituted under the 32nd section of the Coal Mines Regulation Act, 1872, upon the following circumstances; namely,

1. That you, the said James Henry Price, are a person holding a certificate under the above-mentioned Act, and that under such certificate as manager you had the daily supervision of the Burley Colliery, situate in the parish of Wolstanton, in the county of Stafford, the owners of the said colliery being Messrs. Stanier and Company.

2. That on the 27th day of March last you, the said James Henry Price, as such manager as aforesaid did not cause an adequate amount of ventilation to be constantly produced in the mine of the said colliery to dilute and render harmless noxious gases to such an extent that the working places of the shafts, levels, stables, and workings of such mine, and the travelling roads to and from such working places should be in a fit state of working, and passing therein contrary to the 1st General Rule set forth in the 51st section of the said Act.

3. That you, the said James Henry Price, did permit the return air used for the ventilation of the said colliery to pass up a dumb drift and over the furnace of the up-cast shaft of the said colliery. The outlet of such dumb drift into the up-cast shaft being so near to the fire issuing from the said furnace that there was at all times a danger of an explosion happening, if from any cause whatever, the return air used for ventilating the said colliery should become so charged with gas as to be explosive.

4. That you, the said James Henry Price, did on the 26th day of the said month of March last having such daily supervision of the said colliery permit a thirling or air passage to be cut through from the north dips of the said colliery unto a brow called the furnace dip by means of which the air of the north dips had its course shortened by a considerable distance, and was taken more directly up such dumb drift as aforesaid to the up-cast shaft. The effect thereof being to decrease the opportunity for the gas which is carried away in the current of ventilation of becoming so thoroughly diluted by mixing with the air as it could do when its passage with the air was during a longer time through the greater distances.

5. That in consequence of such neglect and mismanagement of the said colliery by you, the said James Henry Price, an explosion occurred at the said colliery on the said 27th day of March last whereby 23 of the workmen at the said colliery were killed, namely, Caleb Whalley, Frederick Whalley, John Hackin, Edward Smith, William Bostock, Joseph Braddock, Henry Piper, Abraham Riley, William Baggalley, James Higginson, John Taylor, Thomas Dale, Joseph Baggalley, James Mayer, Henry Yarwood, James Cork, Thomas Hughes, John Saunders, John Edwards, Richard Fowley, John Stockton, Albert Handy, and William Baggalley, and the lives of the other workmen at the said colliery were seriously endangered.

Dated this 10th day of September 1878.

But when it was proved that Price was only an assistant to a previous manager (Bostock) when the workings were laid out, and that it was Bostock and not he that was responsible for the faulty laying out of the mine, Mr. Spooner and Mr. Evans did not think the *grave error* that I pointed out in my evidence of such a venal character as to justify them in withdrawing or withholding Price's certificate.

On the 7th June another explosion occurred at this company's Silverdale Colliery, and as

no remarks of mine could tell the sad tale with such brevity I will give a copy of the notice sent to me on the 7th June :—

"Dear Sir,

"We beg to inform you that Ezra Clarke, aged 40; George Mansell, 16; and George "Bowers, 14; met with their deaths this afternoon at Silverdale in the 8-ft. seam, No. 6 pit, "from the effects of a shot."

"Yours faithfully,

"STANIER & Co."

And all our inquiries and inspections proved the truth of this simple statement.

On the 30th October the colliers were working with naked lights in the Stafford Pits belonging to the Lilleshall Company where a large fall of roof had taken place, and being close to a fault liberated a quantity of gas which fired at one of the candles and so injured two men that they died in a few days. At the inquest Isaac Jones, the fireman, was committed to Shrewsbury Assizes to take his trial for manslaughter on the following evidence :—

The inquiry touching the death of Edward Hollyhead and George Fletcher was resumed by Mr. Hartley The deceased met with their deaths by an explosion of gas at the Stafford Pits, on the 30th October. The following evidence was given :—

Isaac Jones stated: I am a fireman at the Stafford Pits. Am employed by the chartermaster. On the 30th October I was at work. At five minutes before six in the morning an explosion of gas took place. I had been near the place where it occurred soon after five that morning. I went to meet the air, and got on the top of some roof that had fallen. There was 5 feet between the top of the fall and the roof and I met the air coming. I did not go the other side of the fall; another man does that. I met the deceased in the morning. I did not tell them to clear away the fall, as they knew it was their duty to do it. The gas must have come from a larger fall which happened afterwards. I never saw any gas in that place before, or on that morning. I allowed the men to go with naked lights. It was not an extensive fall. We knew there was a fault. Unless we find gas, we send in the men with naked lamps to clear falls. I told Hollyhead to be careful and not to hurry. I have found no gas there since. It remained the greater part of the day till an air-course was made. The man who was on the other side of the fall will give evidence. I saw him soon after five that morning, and he told me he had been through my district that morning. The fall was about four yards in length before the explosion, after the explosion it had filled the place. I could not see further. It is an uncommon thing in my opinion for a second fall to take place.

John Barber : I am a fireman at the Stafford Pits. Was on night duty the night before the accident happened. I was through the place of the accident between two and three o'clock that morning. There was no fall then. I saw Jones about five o'clock that morning. I did not tell him there was a fall in the face. When I came through all was safe. The ventilation was good. I did not report anything in my book as to this part. I told Jones there was a little breakage elsewhere. It was Jones' duty to go over the place where the fall happened to the next gate-road, it was not my duty. I go round in the morning before the men come, to see that all is right. I left the pit at half-past five that morning.

John Ward (underlooker at the pits): I was down the pit the day before the accident from 6 a.m. to 2.30. I went through the place of the accident between six and seven. Things were as usual here. There was a fault; we had struck it a few days before. There was no gas reported as coming off that fault when we struck it, or at any time. I tried for gas, but did not find it. No fall was reported to me that day. I knew nothing of the fall until after the explosion. It is my duty to give instructions to the fireman as to escapes of gas. I had on other occasions given Jones instructions not to send men in with naked lights. I cannot fix a time, as it is long since we had a fall. But for going with naked lights the deceased would, in my opinion, certainly not have been burnt. It was Jones' duty to go over the place where the accident happened to the next gate-road.

After some consideration the jury decided to return a verdict of "Manslaughter" against Isaac Jones, and he was committed to take his trial at the next assizes, bail in 40*l.* being accepted for his appearance.

The grand jury found a true bill, but the learned judge did not consider the evidence sufficiently strong to commit Jones on so serious a charge, whatever opinions other persons may hold we are bound to respect those opinions, but my conviction grows stronger every year that the prejudices in favour of blasting in mines that is so strong in the minds of colliery managers is gradually dying out, for whenever a manager in my district discards the use of explosives he never returns to that dangerous system. Besides, if the miners, whose prejudices were so *very strong* in favour of the use of powder are now so completely averse to it, surely I am not wrong in hoping that educated men will think less of the easy mode of smashing their coals down, and more of the safety to human life that the system I advocate would undoubtedly ensure.

It is not by explosions alone that men's lives are sacrificed by the use of powder, but fully 20 per cent. of those killed by falls of roof would be saved if powder were prohibited, and in addition to this, if the temptation to use powder were removed, the lives of those men would be saved who disobey the rules relating to missed shots, as not less than 20 men every year are injured from this cause.

Falls of Roof and Sides.

Cannot be considered a satisfactory return, as 21 for last year as compared with 16 for the year before is anything but creditable to the inspectors or managers of the mines and has forced the conviction on my mind that a prosecution should follow in every case when the 16th General Rule is not strictly carried out, for it seems strange that 8 out of 21 should be loaders or roadmen, whose places of work above all others should be made safe, but unfortunately the system prevails of allowing the loaders to load up the coal and then timber the place, and as so much is left to the discretion of the butty, the timber is allowed to bend and break in the roads until the tubs catch a broken prop, and the whole road comes in on to the person driving with the tubs along the level roads, and I can only repeat what has been so often stated that the roads and working places must be made to all appearance *absolutely safe.*

In Shafts.

Ten persons have lost their lives in shafts, which is one more than the year before. Three by overwinding, six by falling out of cages, or other accidents whilst ascending or descending, and one fell from the top of the shaft. The case at Apedale on the 23rd January was owing to negligence on the part of the engineman, but as he was a steady man, and had one rope working at one end of the engine-house lowering bricks and mortar for repairs in that shaft, and the other rope winding men up the shaft at the other end of the engine-house, it was thought he was paying too much attention to the men doing repairs, and too little attention to the ascending men. He has not worked the engine since, neither was he then in a fit state to work any other, as the accident had caused such a shock to his nervous system.

The other case of overwinding on 29th July was at Fenton Colliery, where the engineman had finished winding coals for the day and gone away for a few minutes, when the donkey engineman, hearing a signal that the deceased wanted to come up, started the large engine, but being unable to control it the poor fellow was drawn up to the pulley and thrown down the shaft, a depth of 600 yards; this seemed at first a very serious case, but it appeared that this man Shenton had previously been allowed to do the same thing.

On the 13th April, at Wedgwood Colliery, the hooker-on was crushed at the bottom of the pit, and there could be no moral doubt about the engine having been started without the signal being given, but legal proof could not be obtained.

On the 20th May a careful man named Phillips was sent down one of the pits at Talk-o'-th'-Hill to repair the signal wire, and in coiling the broken wire round him to bring it up the cage by some means caught against a "stay" and threw him out of the cage.

On the 10th August the furnaceman came to the Brookhouse Colliery to attend his furnace, and it being the "wakes," or holiday week, the engineman was away, and the stoker lowered him down, and unfortunately into the sump, where he was found drowned.

On the 26th November a man was thrown down the pit at Poynton owing to that reprehensible practice of allowing the men to get out of the cage without closing the catches, and as it must be done to land the coals, surely it ought to be done to land the men, hence it is advisable to have "self-acting" catches which cannot be neglected unless they are wilfully fastened back. The other two cases admit of no comment as no one could account for their falling, although in each case they had persons with them in the cages.

Miscellaneous Underground.

Under this head there are only 3 deaths to record and all those were on inclines, and as there were 11 killed in 1877 we may fairly indulge in the hope that the many warnings that have been given in years past have had some effect and caused stricter discipline to be enforced among the young persons who are so generally employed on inclined places and on roads.

Ironstone Mines.

There has been a greater loss of life in these mines than usual which is not easily accounted for as the quantity raised is about the same as in 1877, and the care and attention to timbering has not by any means been relaxed, but the low price of stone may have caused more powder to be used and less labour, so as to enable them to get the stone somewhat cheaper, and thus increase the danger by giving a severe shake to the roof.

Instructions.

The new code of instructions will be of great assistance to the inspectors of mines, as it so clearly defines their powers and duties, and by telling them what they should and what they

should not do gives a confidence in the performance of those duties which they did not before possess, for by acting up to the spirit of those instructions the support of the Secretary of State is assured.

The numerous complaints that reach me from the men and from their delegates now prove, upon inspection, to be very truthful, and every attention is given to them, but it is rarely that the men will take advantage of that 30th clause of the Act that gives them the power to inspect the mine themselves, and it is much to be regretted that some payment was not fixed upon as compensation as "*working for nothing*" seems to be the great objection to the performance of so necessary a duty.

The stringent rules laid down by our examining board and the strict way the examiners carry out those rules makes it difficult for any but really competent men to pass the examination, and this will in time materially improve the "status" of managers in this district and tend to insure the safe working of the mines as no one is so capable of managing a colliery in this dangerous kind of work as one who has had some experience in these steep measures.

It is satisfactory to know that the plain statement of facts made last year has satisfied the public that inspectors of mines are fully occupied in the performance of their duties, and have but little time to spare for anything else, and that you may be made aware of the work done during the last year I now give the number of miles travelled

By railway	10,151	
by cab	2,569	
		12,720

And have done the following work:—

General inspections	162
Attended inquests and adjourned inquests	92
Attendances before magistrates	14
Attendance clerks	8
Attendance upon inquiries as to the withdrawal of a manager's certificate	4
Attendance at examination board	2
Journeys to London	10
Journeys to consult with colleagues	8
	300 days.

Besides this I am receiving every year upwards of 5,000 letters, and posting more than 4,000, with other office work that occupies nearly all my evenings, for my assistant is so fully engaged in making inspections he has no time to spare for office work.

The committee who undertook the distribution of the Hartley Fund adopted the plan of giving 5*l.* to the widow of every married man, and 2*l.* 10*s.* to the relatives of every single person that is killed in my district, and it is to be regretted that the amount of the fund is not larger, so that it may last longer, for the money coming in as it does at a time when it is most needed is always received with the utmost thankfulness.

There is ample provision made for the education of miners' children, and there is good ground for believing that they freely avail themselves of the opportunities given them, as year by year the returns show that the number of *young* boys underground and young girls above ground get less and less in number.

The number of collieries is 248, the same as the year before, but several are not working owing to the great depression in the coal and iron trades, as shown in the falling off in the quantity raised in Shropshire, but owing to the potting trade continuing moderately good the depression was not so severely felt in North Staffordshire.

422 non-fatal accidents have been reported, and there is good ground for believing that the Act in this respect is strictly complied with, as many of the cases are of a very trivial nature, but as sometimes serious consequences arise from trifling causes it is at all times advisable to err on the safe side and report *all* accidents, which saves both trouble and expense, for sometimes common report makes a molehill into a mountain, and causes an extra journey to the inspector.

Mr. Gilroy and myself have found, upon inspection and inquiry, that breaches of the law have taken place, and prosecutions leading up to convictions have followed, of which you, Sir, have had the usual return, and therefore I hope I may be excused for not again naming the convictions in this report, for the parties convicted having undergone the *pillory* of the local press at the time of conviction ought not a second time to be held up to the ridicule of their fellow men.

ABSTRACT showing the NUMBER of ACCIDENTS and LOSS OF LIFE at each Colliery in the NORTH STAFFORDSHIRE, CHESHIRE, and SHROPSHIRE DISTRICTS, in the Year ending December 31st, 1878.

Name of Colliery.	Owner.	Coal.		Ironstone.		Total Deaths.
		Accidents.	Deaths.	Accidents.	Deaths.	
NORTH STAFFORDSHIRE.						
Woodshutts	Bidder and Elliott	4	4	—	—	4
Apedale, &c.	Stanier & Co.	6	31	3	3	34
Norton, &c.	Robert Heath	3	3	2	2	5
Shelton	Earl Granville	1	1	1	1	2
Wedgewood	Wedgewood Coal Co.	1	1	—	—	1
Whitfield, &c.	Chatterley Co.	4	4	2	2	6
Podmore Hall	Cooper and Craig	3	3	—	—	3
Talk-o'-th'-Hill	North Stafford Coal Co.	1	1	—	—	1
Audley	Rigby & Co.	1	1	—	—	1
Longton Hall	Glover & Co.	1	1	—	—	1
Great Fenton	Stafford Coal & Iron Co.	1	1	—	—	1
Leycett	Crewe Coal & Iron Co.	1	1	—	—	1
Berry Hill	Wm. Bowers	1	1	—	—	1
Jammage	Represtives. of late J. Wedgewood	1	1	—	—	1
Thursfield	Kinnersley & Co.	—	—	1	1	1
High Carr	J. H. Williamson	—	—	1	1	1
Sandbach	Tellwright & Watkin	—	—	1	1	1
SHROPSHIRE.						
Hinkshay	Heybridge Iron Co.	1	1	—	—	1
Lilleshall	Lilleshall Co.	2	3	1	2	5
Newhouse	G. Fenn	1	1	—	—	1
CHESHIRE.						
Dunkirk	Dunkirk Coal Co.	2	2	—	—	2
Poynton	Lord Vernon	1	1	—	—	1
	Total	36	62	12	13	75

List of Mines in North Staffordshire, Cheshire, and Shropshire.

Name of Colliery.	Postal Address.	Owner or Company.	Manager.	Remarks.
		North Staffordshire.		
Common Side	Cheadle	William Malkin	R. Robertson	Coal.
Well Street	Ditto	Ditto	Ditto	Ditto.
Cross Flats	Ditto	Salt & Co.	C. Salt	Ditto.
Callow Hill	Ditto	Ditto	Ditto	Ditto.
Dillhorne	Ditto	Ditto	Ditto	Ditto.
Woodhead	Ditto	William Bowers	J. Edwards	Ditto.
Hazlewall	Ditto	Ditto	Ditto	Ditto.
Cheadle	Ditto	Plant & Co.	R. Coe	Ditto.
Ipstones Park	Ditto	Southall & Co.	W. Southall	Ironstone.
Consall	Ditto	Scott & Co.	D. Bettany	
Delphouse	Ditto	Sir Lionel Pilkington	- -	Standing.
Litley	Ditto	Bolton & Son	- -	Ditto.
Park Hall	Ditto	Almond & Co.	F. Southall	Coal.
Little Above Park	Ditto	Mann & Co.	- -	Standing.
Bradley Green	Congleton	J. & T. Bradbury	W. Chaddock	Coal.
Adderley Green	Longton	Stirrup & Pye	J. R. Haines	Ditto.
Bentilee	Ditto	Hawley & Co.	F. H. Hawley	Ditto.
Mossfields	Ditto	Ditto	Ditto	Ditto.
Willfield	Ditto	Thomas Mellor	D. Whitehead	Ditto.
Brownsfield	Ditto	Booth & Sons	T. Booth	Ditto.
Weston Coyney	Ditto	Weston Coyney Colliery Co.	S. Higgins	Ditto.
Fenton Park	Ditto	Boughey and Armistead	G. Stevenson	Ditto.
Victoria	Ditto	- - -	- -	Standing.
Florence	Ditto	Duke of Sutherland	G. Stevenson	Coal.
Foley	Ditto	Goddard & Sons	M. Atkins	Ditto.
Goldenhill	Ditto	Ditto	Ditto	Standing.
Stone Road	Ditto	Ditto	Ditto	Sinking.
Old Field	Ditto	Ditto	Ditto	Coal and ironstone.
Pool Dole	Ditto	Ditto	Ditto	Ditto.
Anchor	Ditto	H. Ashwell	Ditto	Standing.
Hulme Valley	Ditto	Credit Co., Limited	J. Clegg	Coal.
Gainmore	Ditto	Ditto	Ditto	Standing.
Hill Top	Ditto	Hill Top Colliery Co., Limited.	— Millington	Coal.
Longton Hall	Ditto	J. & A. Glover	J. G. Bakewell	Coal and ironstone.
Ubberley Hall	Ditto	Harp & Sons	Jno. Harp	Coal.
Meir Hey	Ditto	A. Sparrow	G. Mitcheson	Ditto.
Bells Mill	Hanley	Earl Granville	J. Lucas	Coal and ironstone.
Lady's Well	Ditto	Ditto	Ditto	Ditto.
Far Green	Ditto	Ditto	Ditto	Ditto.
Boothen	Ditto	Ditto	Ditto	Ditto.
Slippery Lane	Ditto	Ditto	Ditto	Ditto.
Foxley	Ditto	Ditto	Ditto	Ditto.
Pear Tree	Ditto	Ditto	Ditto	Ditto.
Joiner's Square	Ditto	Ditto	Ditto	Ditto.
Hanley and Bucknall.	Ditto	New Hanley & Bucknall Co., Limited.	J. Macknay	Coal.
Bucknall	Ditto	Elijah Lingard	E. Lingard	Ditto.
Blakelow	Ditto	Co-operative Coal Co.	- -	Ditto.
Ivy House	Ditto	Ivy House & Northwood Co., Limited.	W. Bridgett	Ditto.
North Wood	Ditto	Ditto	Ditto	Ditto.
Townsend	Ditto	Holdcroft & Co.	T. Holdcroft	Ditto.
Wetley Moor	Ditto	Wetley Moor Coal and Firebrick Co.	G. Nichols	Coal, ironstone, and fire-clay.
Bucknall Church	Ditto	Whitead & Co.	- -	Standing.
Bank Top	Burslem	James Ashworth	J. Ashworth	Coal.
Cobridge	Ditto	Tellwright & Watkin	T. Chadwick	Coal and ironstone.
Sandbach	Ditto	Ditto	Ditto	Ditto.
Hamil	Ditto	Reps. of late J. Wedgewood.	E. Gater	Standing.
Bycars	Ditto	Ditto	Ditto	Fireclay.
Jackfield	Ditto	Plant & Co.	S. Higgins	Coal.
Newhayes	Ditto	Thomas Wilkinson	T. Wilkinson	Coal and ironstone.
Sneyd Farm	Ditto	Sneyd Colliery Co.	W. Heath	Ditto.
Stanfield	Ditto	Stanfield Colliery Co.	R. H. Cole	Ditto.
Sneyd Green	Ditto	Stanier & Co.	- -	Standing.
Mill Hayes	Ditto	Hollins & Co.	" "	Ditto.

List of Mines—*continued.*

Name of Colliery.	Postal Address.	Owner or Company.	Manager.	Remarks.
Bradeley	Burslem	George Moss		Standing.
Chell	Tunstall	R. Beswick & Co., Limited.	R. Beswick, jun.	Coal and ironstone.
Goldenhill	Ditto	Williamson Brothers		Ditto.
Lowlands	Ditto	Ditto		Ditto.
Stonetrough	Ditto	Ditto	S. Eardley (Agent)	Coal.
Tower Hill	Ditto	Ditto	Ditto	Ditto.
Yeldhill	Ditto	Ditto	Ditto	Coal and ironstone.
Furlong	Ditto	William Adams	T. Sherratt	Ditto.
Greenfields	Ditto	Ditto	Ditto	Standing.
Packmoor	Ditto	Lawton Brothers	T. Lawton	Coal and ironstone.
Ditto	Ditto	New Packmoor Colliery Co.	A. Cleobury	Ditto.
Thursfield	Ditto	Kinnersley & Co.	T. E. Storey	Ditto.
Turnhurst	Ditto	Turnhurst Colliery Co.		Ditto.
Wedgewood	Ditto	Wedgewood Coal Co., Limited.	T. Clewes	Ditto.
Lane Ends	Ditto	Ditto	Ditto	Ditto.
Harriseahead	Ditto	Samuel Taylor & Co.	S. Taylor	Coal.
Tileries	Ditto	Thomas Peake	E. Lovekin	Coal and ironstone.
Brownhills	Ditto	Brownhills Mining Co.	W. H. Gilderoy	Ditto.
Chatterley	Ditto	Chatterley Iron Co.	John Salt	Ditto.
High Lane	Ditto	Ditto	J. Thompson	Ditto.
Pinnox	Ditto	Ditto	Ditto	Ditto.
Scotia	Ditto	Ditto	Ditto	Standing.
Ridgeway	Ditto	Ditto	Ditto	Ditto.
Newfield	Ditto	Mellor and Scragg	W. Scragg	Coal and ironstone.
Whitfield	Ditto	Chatterley Iron Co., Limited.	E. Thompson	Coal.
Oxford	Ditto	Ditto	J. Thompson	Coal and ironstone.
Apedale	Newcastle	Stanier & Co.	J. H. Price	Ditto.
Silverdale	Ditto	Ditto	J. Strick	Ditto.
Park House	Ditto	Ditto	Ditto	Ditto.
Crackley	Ditto	Ditto	Ditto	Standing.
The Nabs	Ditto	Ditto	Ditto	Coal and ironstone.
Holly Wood	Ditto	Ditto	Ditto	Ditto.
The Grove	Ditto	Ditto	Ditto	Ditto.
Clough Hall	Ditto	Kinnersley & Co.	T. E. Storey	Ditto.
Kidsgrove	Ditto	Ditto	Ditto	Ditto.
Hollinwood	Ditto	Ditto	Ditto	Ditto.
Ranscliff	Ditto	Ditto	Ditto	Ditto.
Trubsnaw	Ditto	Ditto	Ditto	Ditto.
Bignall Hill	Ditto	Reps. of late J. Wedgewood.	E. Gater	Coal.
Jammage	Ditto	Ditto	Ditto	Ditto.
Old Hays Wood	Ditto	Miners Association		Standing.
Highcarr	Ditto	J. H. Williamson	W. Taylor	Coal and ironstone.
Knutton	Ditto	Stanier & Co.	J. Strick	Ditto.
Oak	Ditto	Ditto	Ditto	Ditto.
Knutton Farm	Ditto	Viggars & Co.	B. Viggars	Ditto.
Racecourse	Ditto	Ditto	Ditto	Ditto.
Rosemary Hill	Ditto	J. N. Peake	E. Lovekin	Ditto.
Whitebarn	Ditto	John Blaikie	J. Mould	Ditto.
Madeley	Ditto	Crewe Coal & Iron Co., Limited.	R. Stevenson	Coal.
Leycett	Ditto	Ditto	Ditto	Ditto.
Red Street	Ditto	Bentley & Co.	J. Bentley	Coal and ironstone.
Podmore Hall	Ditto	Cooper & Craig	J. Young	Coal.
Miles Green	Ditto			Standing.
Millbank	Ditto	J. H. Pearson		Coal and ironstone.
Glass House	Ditto	Chesterton Coal Co., Limited.	G. Clark	Ditto.
Chesterton	Ditto	Ditto	Ditto	Ditto.
High Carr	Ditto	High Carr Coal and Ironstone Co.	J. Lawton	Ditto.
Hem Heath	Ditto	Hem Heath Mining Co.	W. Galley	Ditto.
Berry Hill	Stoke-on-Trent	Wm. Bowers	W. Griffiths	Ditto.
Holly Bush	Ditto	Ditto	Ditto	Ditto.
Lawn	Ditto	Chatteley Iron Co., Limited.	J. Corrie	Coal.
Brookhouse	Ditto	Ditto	Ditto	Ditto.
New Ubberley	Ditto	Ditto	Ditto	Ditto.
Biddulph Valley	Ditto	Robert Heath & Son	J. Coe	Coal and ironstone.
Norton	Ditto	Ditto	Ditto	Ditto.

List of Mines—*continued.*

Name of Colliery.	Postal Address.	Owner or Company.	Manager.	Remarks.
The Grange	Stoke-on-Trent	Robert Heath & Son	J. Worgan	Coal and ironstone.
Bellerton Lane	Ditto	Ditto	Ditto	Ditto.
Newchapel	Ditto	Ditto	W. S. Coe	Ditto.
Bent	Ditto	Ditto	Ditto	Ditto.
Audley	Ditto	Rigby & Co.	B. Johnson	Coal.
Hayswood	Ditto	Ditto	Ditto	Coal and ironstone.
Swan	Ditto	Ditto	G. Sumner	Coal.
Bunkers Hill	Ditto	Ditto	Ditto	Ditto.
Great Fenton	Ditto	Stafford Coal and Iron Co., Limited.	T. Nicholls	Coal and ironstone.
Red Hall	Ditto	Alfred Pearson	-	Standing.
Harecastle	Ditto	Bidder & Elliot	G. Wilkinson (Agent)	Coal.
Woodshutts	Ditto	Ditto	Ditto	Ditto.
Lawton	Ditto	Ditto	Ditto	Ditto.
Talk-o'-th'-Hill	Ditto	New North Stafford Coal and Iron Co.	G. Hunter	Ditto.
Mitchell's Wood	Ditto	Ditto	Ditto	Coal and ironstone.
Red Cross	Biddulph	George Gaskell	W. Scott	Coal.
Park Farm	Ditto	Gaskell & Co.	Ditto	Standing.
Hall-o'-Lee	Ditto	Stanfield Colliery Co.	R. H. Cole	Coal.
Newpool	Ditto	Cox and Twyford	-	Standing.
Hurst Vale	Ditto	-	-	Ditto.

CHESHIRE.

Whaley Bridge	Stockport	L. and E. Hall	-	Coal.
Adlington	Ditto	Jonathan Jowett	-	Ditto.
Banks End	Disley, Stockport	L. & E. Hall	-	Ditto.
Bugsworth	Hayfield, Stockport.	Ditto	-	Ditto.
Burnt Edge	Ditto	Ditto	-	Ditto.
Bredbury	Stockport	Bredbury Coal Co.	J. Wooley	Ditto.
Disley	Ditto	Samson Maiden	-	Ditto.
Mellor	Ditto	Jonathan Jowett	-	Ditto.
Middlecale	High Lane, Stockport.	Brocklehurst & Co.	H. Brocklehurst	Standing.
Norbury	Ditto	Clayton & Brooke	J. Goodwin	Coal.
Poynton and Worth	Poynton, Stockport.	Lord Vernon	G. C. Greenwell, jun.	Ditto.
Ringstones	Whalley Bridge, Stockport.	J. Jackson	-	Ditto.
Harper's Brook	Marple, Stockport.	Thos. Wainwright	T. Wainwright	Coal and fire-clay.
Robinsclough	Stockport	W. & H. Hand	H. Hand	Ditto.
Winterfold	Adlington, Stockport.	Daniel Kirk	-	Standing.
Furnace Vale	Disley, Stockport	-	-	Ditto.
Redacre	Poynton, Stockport.	George Needham	G. Needham	Coal and fire-clay.
Dunkirk	Dukinfield	Dunkirk Coal Co.	W. Seddon	Coal and cannel.
Astley	Ditto	Ditto	Ditto	Ditto.
Fireclay	Ditto	Hall & Son	-	Coal and fire-clay.
Victoria	Ditto	J. D. P. Astley	S. Davis	Coal and cannel.
Backspond	Lyme, Macclesfield.	W. Hewitt	-	Coal.
Bakestone Dale	Macclesfield	W. Gardiner	-	Ditto.
Eddisbury	Rainow, Macclesfield.	Jonathan Hully	J. Hully	Ditto.
Hough Hole	Ditto	W. Mellor	-	Standing.
Lymer Clough	Ditto	-	-	Ditto.
Throstles Nest	Ditto	-	-	Ditto.
Pottshrigley	Macclesfield	Geo. Lambert	W. Gardner	Coal.
Sponds	Lyme, Macclesfield.	James Jackson	-	Ditto.
Bayleyfield	Hyde	T. J. & J. Ashton	James Phillips	Ditto.
Hyde	Ditto	Hyde Colliery Co.	J. Goodwin	Ditto.
Lime Kilns	Marple	Wright, Tymm, & Co.	W. Tymm	Ditto.
Daisyfield	Hyde	Mellor & Co.	-	Ditto.
Neston	Neston, Chester	Neston Colliery Co.	W. Hampson	Ditto.
Brink	Macclesfield	B. Cooke	-	Ditto.
Barro Clough	Ditto	-	-	Standing.
Dane Thorn	Buxton	Harold Hand	H. Hand	Coal.

List of Mines—*continued.*

Name of Colliery.	Postal Address.	Owner or Company.	Manager.	Remarks.
		SHROPSHIRE.		
Lilleshall	Wellington	Lilleshall Co.	N. T. Beech	Coal and ironstone.
Donnington	Ditto	Ditto	Ditto	Ditto.
Prior's Lee	Ditto	Ditto	R. Moffitt	Ditto.
Woodhouse	Ditto	Ditto	Ditto	Ditto.
Hadley	Ditto	Ditto	Ditto	Ditto.
Stafford	Ditto	Ditto	Ditto	Ditto.
Granville	Ditto	Ditto	N. T. Beech	Ditto.
Madeley Court	Ditto	Madeley Court Co.	G. Round	Ditto.
Calcutts	Ditto	Ditto	Ditto	Ditto.
Broseley	Ditto	Ditto	Ditto	Ditto.
Old Park	Ditto	Old Park Iron Co.	A. H. Maurice	Ditto.
Malins Lee	Ditto	Ditto	Ditto	Ditto.
Stirchley	Ditto	Ditto	Ditto	Ditto.
Wombridge	Ditto	Executors of J. Bennett	J. Teague	Ditto.
Horseleasow	Ditto	Ditto	Ditto	Ditto.
Coalbrookdale	Ditto	Coalbrookdale Co.	H. Rawson	Ditto.
Dawley Bank	Ditto	Ditto	Ditto	Ditto.
Horse Hay	Ditto	Ditto	Ditto	Ditto.
Lawley	Ditto	Ditto	Ditto	Ditto.
Broseley	Ditto	Ditto	Ditto	Ditto.
Lawley Bank	Ditto	Ditto	Ditto	Ditto.
Lightmore	Ditto	Ditto	Ditto	Ditto.
Roughfields	Ditto	Ditto	Ditto	Ditto.
Ketley	Ditto	John Williams	J. Williams	Ditto.
Waterloo	Ditto	Ditto	Ditto	Ditto.
Wigginton	Oswestry	Wigginton Hall Colliery Co.	-	Standing.
Drill	Ditto	Drill Coal & Fireclay Co.	— Millington	Coal and fire-clay.
Trefonen	Ditto	France & Co.	J. Wedge	Ditto.
Shorthill	Shrewsbury	John Atherton	J. Atherton	Coal.
Hanwood	Ditto	Hanwood Coal Co.	Ditto	Ditto.
Arscott New	Ditto	J. Proctor	E. Jones	Ditto.
Lebotwood	Ditto	R. Preen	-	Coal and fire-clay.
Moat Hall	Ditto	Shorthouse & Co.	W. Shorthouse	Ditto.
Ifton Rhyn	Chirk	Ifton Rhyn Coal Co.	-	Standing.
Quinta	Ditto	Quinta Coal Co.	D. Lomax	Coal and fire-clay.
Moreton Hall	Ditto	Ruabon & North Wales Co.	W. Pattison	Coal.
Preesgwyn	Ditto	Ditto	Ditto	Ditto.
Benthall	Broseley	Benthall Pottery Co.	-	Coal and fire-clay.
Coppice	Ditto	W. & J. Evans	J. Evans	Ditto.
Fish House	Ditto	L. E. Woolstine	L. E. Woolstine	Ditto.
Coniebury	Ditto	Thomas Plimley	T. Plimley	Ditto.
Hay Cop Hill	Ditto	Hill & Aston	J. Aston	Ditto.
Benthall	Ditto	Ditto	Ditto	Ditto.
Ditto	Ditto	Evans & Gough	Gough	Ditto.
Jackfield	Ditto	Wm. Exley	W. Exley	Ditto.
Arscott	Longdon, Salop	Ditto	Ditto	Ditto.
New House	Ditto	George Fenn	G. Fenn	Ditto.
Castleplace	Ditto	William Wild	W. Wild	Ditto.
Frodesley	Ditto	-	-	Ditto.
Asterley New	Ditto	-	-	Ditto.
Madeley Wood	Ironbridge	W. R. Anstice & Co.	W. Ward	Coal and ironstone.
Knowbury	Ludlow	Roberts & Co.	J. Tolly	Coal.
Catherton	Ditto	J. Patchett & Co.	H. Jones	Ditto.
Watsall	Ditto	Summers & Garbutt	W. Briscoe	Ditto.
Cornbrook	Ditto	Clee Hills Coal Co.	J. Tolly	Ditto.
Boycott	Pontesbury	Boycott Colliery Co.	-	Standing.
Farley	Ditto	George Edwards	G. Edwards	Coal.
Dark Lane	Shifnal	Heybridge Iron Co.	J. Briscoe	Coal and ironstone.
Hinkshay	Ditto	Ditto	Ditto	Ditto.
Park	Ditto	Ditto	Ditto	Ditto.
Kimberton	Ditto	W. R. Anstice & Co.	W. Ward	Coal.
Tasley	Bridgnorth	-	-	Ditto.
Billingsley	Ditto	W. Birchley	-	Ditto.
Harcourt	Cleobury Mortimer.	Robert Jones	-	Ditto.
Asterley	Minsterley	Butler & Co.	-	Ditto.

Much to my regret, my able assistant, Mr. Gilroy, has left the service to take the management of Powells Dyffryn Collieries in South Wales, and let us hope that what is my loss will be Sir George Elliot's gain, but it is rather remarkable that both my assistants have left me to "better themselves," so that it does not appear that the inspectorship of mines is that easy and lucrative calling that some persons suppose it to be.

The Metalliferous Mines Regulation Act.

The Ecton, the Warslow, the New Mine, and the Old Mine are still standing, and will continue in this state unless some material change takes place in the value of mining produce, but having been informed that several old shafts in the neighbourhood of Waterhouses were in a dangerous state, but on my inspecting them and calling the attention of the owners to the danger, the pits were at once either fenced or filled up.

I have, &c.,
THOMAS WYNNE.

The Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Whitehall, London.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the NORTH STAFFORDSHIRE, CHESHIRE, and SHROPSHIRE DISTRICT, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous, Underground.	Above ground.	Total.
1878.														
Jan. 2	1	Woodshutts	Kidsgrove	Bidder and Elliot	Ed. Ellis	Loader	20	Fall of coal	—	1	—	—	—	1
„ 17	2	Dunkirk	Dukinfield	Dunkirk Coal Co.	John Hague	Collier	36	Fall of coal	—	1	—	—	—	1
„ 23	3	Apedale	Newcastle	Stanier and Co.	J. Smith and another	Ditto	—	Drawn over pulley at pit top, and thrown out of cage.	—	—	2	—	—	2
„ 30	4	Norton	Burslem	Robt. Heath and Son	C. Lightwood	Ditto	42	Fall of coal	—	1	—	—	—	1
Feb. 23	5	Shelton	Hanley	Earl Granville	E. Jones	Ditto	29	Fall of roof	—	1	—	—	—	1
Mar. 23	6	Harecastle	Kidsgrove	Bidder and Elliot	F. Lawton	Waggoner	17	Ditto	—	1	—	—	—	1
„ 27	7	Apedale	Newcastle	Stanier and Co.	C. Whalley & 22 others	Colliers	—	Explosion of fire-damp	23	—	—	—	—	23
April 3	8	Silverdale	Silverdale	Ditto	John Dean	Butty	31	Fall of coal	—	1	—	—	—	1
„ 13	9	Wedgewood	Tunstall	Wedgewood Colliery Co.	Jas. Owen	Hooker-on	60	Crushed against guide rods by cage	—	—	1	—	—	1
„ 17	10	Whitfield	Ditto	Chatterley Iron Co.	Jas. Shaw	Collier	39	Fall of roof	—	1	—	—	—	1
May 8	11	Podmore Hall	Newcastle	Cooper and Craig	R. Thomas	Shifter	58	Crushed by tub on dip	—	—	—	1	—	1
„ 14	12	Hinkshay	Wellington	Heybridge Iron Co.	Chas. Jones	Loader	17	Fall of roof	—	1	—	—	—	1
„ 20	13	Talk-o'-th'-Hill	Kidsgrove	North Stafford Coal Co.	Jno. Phillips	Collier	48	Thrown out of cage to bottom of shaft.	—	—	1	—	—	1
„ 24	14	New House	Dorrington	G. Fenn	Ed. Whittall	Ditto	—	Fall of roof	—	1	—	—	—	1
June 1	15	Norton	Burslem	Robt. Heath and Son	Geo. Knight	Loader	19	Ditto	—	1	—	—	—	1
„ 7	16	Silverdale	Silverdale	Stanier and Co.	E. Clark & two others	—	—	Explosion of fire-damp	3	—	—	—	—	3
„ „	17	Audley	Newcastle	Rigby and Co.	W. Sproson	Collier	26	Fall of coal	—	1	—	—	—	1
„ 14	18	Apedale	Ditto	Stanier and Co.	E. Moulton	Ditto	47	Falling down shaft	—	—	1	—	—	1
July 1	19	Podmore Hall	Ditto	Cooper and Craig	John Cox	Loader	25	Fall of roof	—	1	—	—	—	1
„ 15	20	Longton Hall	Longton	Glover and Co.	Geo. Ryles	Collier	37	Ditto	—	1	—	—	—	1
„ 17	21	Brookhouse	Stoke	Chatterley Iron Co.	Wm. Wardles	Taker-off	15	Tub ran down jig upon him	—	—	—	1	—	1
„ 29	22	Great Fenton	Ditto	Stafford Coal and Iron Co.	Wm. Dale	Collier	23	Thrown down shaft by being drawn up to pulley.	—	—	1	—	—	1
Aug. 7	23	Leycett	Newcastle	Crewe Coal and Iron Co.	Jno. Brooks	Taker-off	18	Chain broke and tub caught deceased at bottom of dip.	—	—	—	1	—	1
„ 9	24	Brookhouse	Stoke	Chatterley Iron Co.	Jno. Saunders	Hooker-on	45	Let down in cage into water in sump and drowned.	—	—	1	—	—	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous. Underground.	Above ground.	Total.
1878.														
Sept. 16	25	Harecastle -	Kidsgrove -	Bidder and Elliott -	John Booth -	Driver -	16	Fall of roof - - -	–	1	–	–	–	1
Oct. 1	26	Berry Hill -	Stoke - -	W. Bowers - -	John Degnell -	Loader -	23	Ditto - - - -	–	1	–	–	–	1
„ 14	27	Dunkirk -	Dukinfield -	Dunkirk Colliery Co. -	A. Hubbert -	Collier -	25	Ditto - - -	–	1	–	–	–	1
„ 30	28	Lilleshall -	Wellington -	Lilleshall Co. - -	G. Fletcher and another.	Ditto -	—	Explosion of fire-damp - -	2	–	–	–	–	2
Nov. 2	29	Apedale -	Newcastle -	Stanier and Co. - -	James Davis -	Ditto -	62	Fall of coal - - -	–	1	–	–	–	1
„ 30	30	Jammage -	Ditto -	Representatives of late J. Wedgewood.	Jas. Dolan -	Ditto -	36	Fall of roof - - - -	–	1	–	–	–	1
„ „	31	Poynton -	Stockport -	Lord Vernon - -	W. Birchenough -	Prop Cutter	77	Crushed by cage at top of shaft -	–	–	1	–	–	1
Dec. 3	32	Biddulph -	Congleton -	Robt. Heath and Son -	S. Garbutt -	Collier -	28	Fall of coal - - -	–	1	–	–	–	1
„ „	33	Harecastle -	Kidsgrove -	Bidder and Elliot -	Jas. Gordon -	Fireman -	—	Fell off cage down shaft - -	–	–	1	–	–	1
„ 6	34	Lilleshall -	Wellington -	Lilleshall Co. - -	Jas. White -	Roadman -	39	Fall of roof - - -	–	1	–	–	–	1
„ 14	35	Brookhouse -	Stoke - -	Chatterley Iron Co. -	Geo. Hurd -	Loader -	18	Fell out of cage to bottom of shaft	–	–	1	–	–	1
„ 17	36	Podmore -	Newcastle -	Cooper and Craig -	Robt. Evans -	Collier -	35	Fall of roof - - -	–	1	–	–	–	1
								Total - -	28	21	10	3	–	62

LIST of the FATAL IRONSTONE ACCIDENTS, and LOSS of LIFE arising therefrom, in the NORTH STAFFORDSHIRE and SHROPSHIRE DISTRICT, during the Year ending 31st of December 1878.

Date.	No. of Accidents.	Name of the Mine.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous. Underground.	Above ground.	Total.
1878.														
Jan. 2	1	Chatterley -	Tunstall -	Chatterley Iron Co. -	Wm. Pate -	Collier -	43	Fall of roof - - -	–	1	–	–	–	1
,, 17	2	Grange -	Hanley - -	Robt. Heath and Son -	Ralph Lowe -	Ditto -	47	Fall of ironstone - -	–	1	–	–	–	1
,, 30	3	Silverdale -	Newcastle -	Stanier and Co. -	Ralph Downing -	Ditto -	58	Ditto - - -	–	1	–	–	–	1
Feb. 21	4	Holly Wood -	Silverdale -	Ditto - -	Jno. Porter -	Ditto -	43	Ditto - - -	–	1	–	–	–	1
April 3	5	Lilleshall -	Wellington -	Lilleshall Co. - - -	N. Oliver and another.	Sinkers	—	Fell 28 yards out of cage to bottom of shaft.	–	–	2	–	–	2
July 15	6	Apedale -	Newcastle -	Stanier and Co. - -	Jas. Bairne -	Furnaceman	69	Fell off cage into sump - -	–	–	1	–	–	1
,, 30	7	Grange - -	Hanley - -	Robt. Heath and Son -	Wm. Rowley -	Collier -	53	Fall of roof - - -	–	1	–	–	–	1
Oct. 2	8	Thursfield -	Kidsgrove -	Kinnersley and Co. -	Jno. Henshall -	Ditto -	30	Fall of ironstone - -	–	1	–	–	–	1
,, 5	9	High Carr -	Newcastle -	J. H. Williamson -	Geo. Wooley -	Ditto -	36	Ditto - - - -	–	1	–	–	–	1
Nov. 13	10	Shelton -	Hanley - -	Earl Granville - -	T. Mollart -	Ditto -	35	Ditto - - - -	–	1	–	–	–	1
Dec 6	11	Sandbach -	Ditto -	Tellwright and Watkin -	Jas. Joyce -	Loader -	16	Ditto - - - -	–	1	–	–	–	1
,, 28	12	Chatterley -	Tunstall - -	Chatterley Iron Co. -	Jno. Scott -	Ditto -	33	Ditto - - - -	–	1	–	–	–	1
								Total - -	–	10	3	–	–	13

Report of Assistant Inspector.

Sir, Stone, 13th February 1879.

I have the honour to report that during the past year I exercised the duties of inspector of mines in the district of North Staffordshire, Cheshire, and Shropshire, and that in so doing I acted as assistant to and under the directions of Mr. Thomas Wynne.

I have, &c.,

S. B. GILROY.

The Right Hon. R. A. Cross, M.P.,
Principal Secretary of State,
Home Department, Whitehall,
London, S.W.

Mr. Alexander's Report.

REPORT upon the INSPECTION OF MINES in the WESTERN MINING DISTRICT of SCOTLAND for the Year ending 31st December 1878, by WILLIAM ALEXANDER, Esq.

SIR, Glasgow, 29th March 1879.

DURING the past year the mining industry of this district has been carried on in 317 mines by 26,288 persons, classified, as to age, as under :—

Underground.					Above Ground.—Ages							
Male Persons.—Ages					10 to 13.		13 to 16.		Above 16.		Total.	Total above and below Ground.
10 to 12.	12 to 13.	13 to 16.	Above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.		
—	188	2,107	19,528	21,823	4	—	260	12	88	4,101	4,465	26,288

and the gross produce, or the result of their joint labour, amounted to 8,203,177 tons.

As might have been anticipated, owing to the languid state of trade generally, the work for the year has been restricted, and, when compared with 1877, shows a falling off of 700,000 tons.

The following will show in what the diminution principally consists :—

Year.	Coal.	Ironstone.	Fireclay.	Shale.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.
Produce for 1878 -	6,169,723	1,723,078	199,311	111,065	8,203,177
„ 1877 -	6,867,701	1,723,161	215,898	104,217	8,910,977

The rate of output per annum for each person has been 312 tons. This, however, does not convey a correct estimate of the actual labour of each, in consequence of the irregularity of work which prevailed more or less throughout the district. It may be of interest, however, to compare the past with some of the previous years, in some of which employment was plentiful.

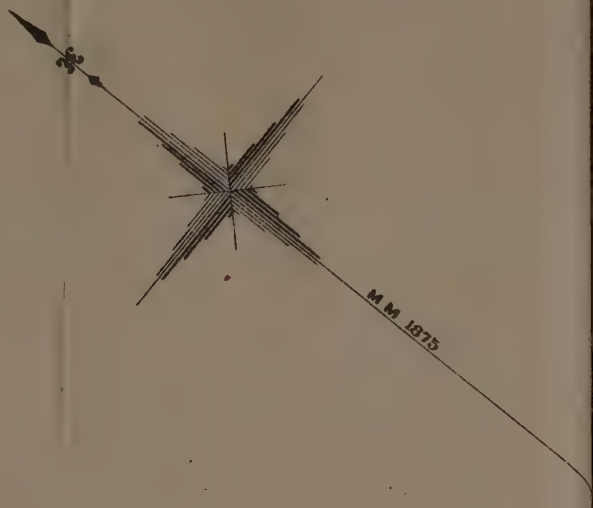
OUTPUT per person for the last six years.

1873	-	256 tons.
1874	-	252 „
1875	-	298 „
1876	-	310 „
1877	-	318 „
1878	-	312 „

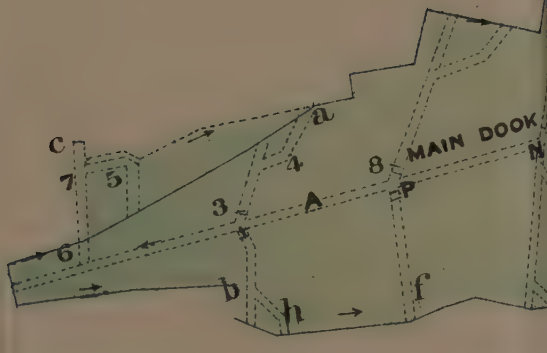
For example, in 1874, a time unprecedented for high prices, it required 6,463 additional hands to man the mines and get within a few tons of the production of 1878.

The dulness which at present seems to hang over every branch of industry is probably felt more intensely in the coal and iron trade than in any other; but, from whatever cause, the gloom still remains, intensified by commercial disasters, over-production, competition, &c., and, very likely, the natural reaction from such a strained state of things as existed a few years ago.

In the glutted condition of the labour market and absence of any pressure of untrained labour into the mines, it might have been expected that the loss of life would not have been in excess of former years. Unfortunately, however, such is not the case, and the loss of life



Plan of
BARRWOOD
COAL WORKINGS.
1878.



The Figures indicate where the bodies were found

1 *Alexander Burns, Bottomer*
2 *James Wardrope Jun.r and David Gould*
3 *James Wardrope Sen.r Walter Wardrope, Alex.r Ross, James Ross, John Miller, William Cameron and James Cameron.*
4 *James Gould*
5 *George Young and Robert White*
6 *Walter Ralston*
7 *Edward Hardie*
8 *Walter Cowan, Chain runner, David Fleming Engine boy was got out of the Mine but died two weeks after.*

Scale o

100 50 0 100 200 300 400

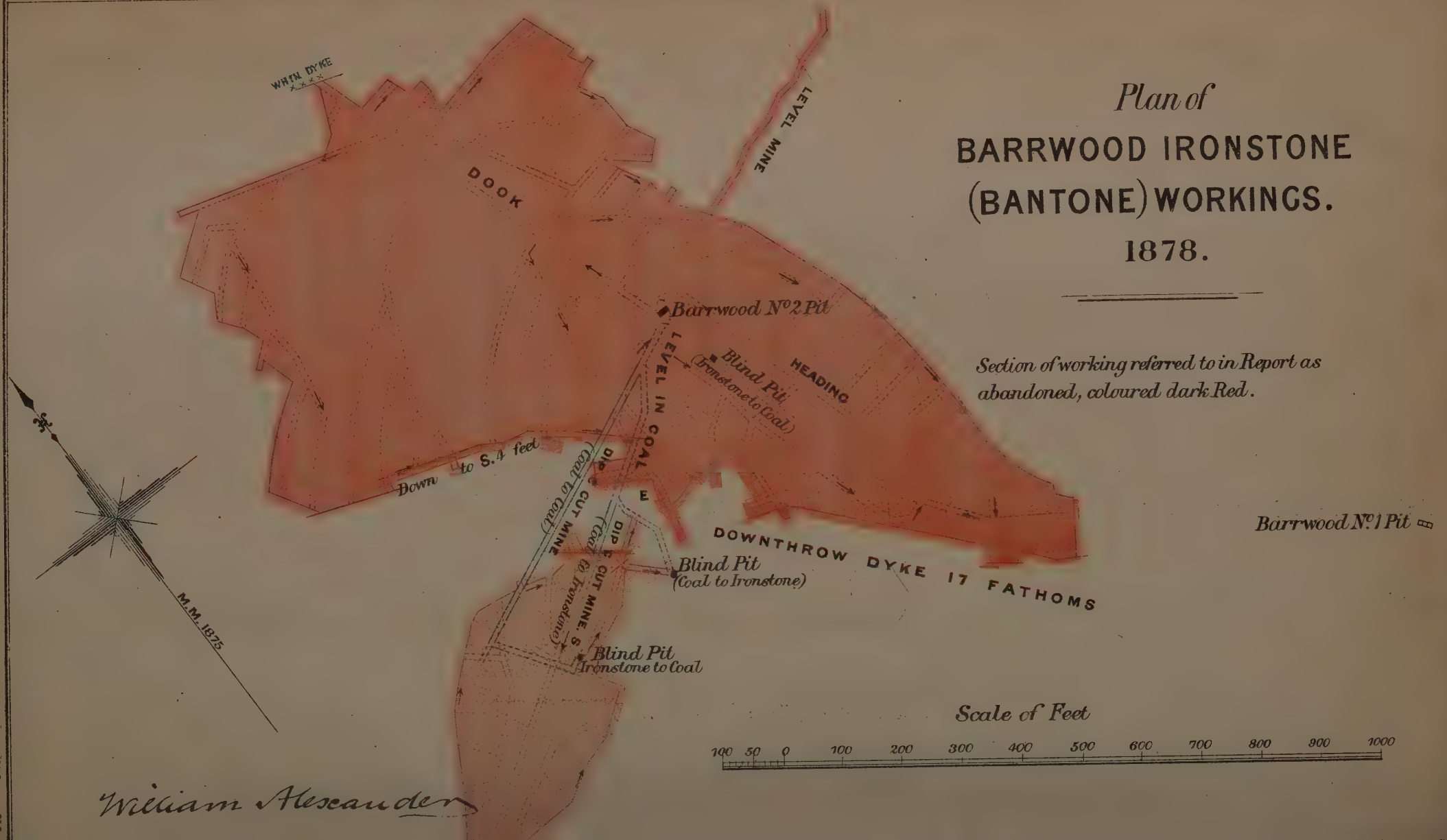
William Alexander

Insp^r of Mines

Feet

600 700 800 900 1000 feet

Dangerfield. Lith. 22. Bedford St. Covent Garden



Plan of
BARRWOOD IRONSTONE (BANTONE) WORKINGS.
1878.

Section of working referred to in Report as abandoned, coloured dark Red.

William Alexander

DANGERFIELD, LITH 22, BEDFORD ST, COVENT GARDEN

for 1878 has been the greatest I have had to record for the last 23 years. From all causes the number of accidents reported amounted to 210, and of these 49 proved fatal, resulting in the loss of 69 lives. Compared with past years, the number of accidents has rather diminished, but the loss of life, from two or three unusual disasters, has been excessive.

By four explosions 22 lives were lost. The first took place on the 8th of March at Barrwood Colliery, situated on the rising ground to the south of and in close proximity to the village of Kilsyth. It consists of two pits, Nos. 1 and 2. No. 1 pit, the upcast, upwards of 400 yards to the south-east of No. 2, is 121 fathoms deep to the coking coal, a seam well known in the district, and No. 2 pit, the downcast, is 142 fathoms deep to the same seam. Besides the coking coal, the "Bantone" ironstone, lying 14 fathoms above it, and the "Gartshore" ironstone, lying 63 fathoms above the "Bantone" seam, had both been worked from No. 2 pit. The latter had been abandoned for a number of years, and the greater part of the former since the commencement of 1878. The coking coal averages 3 ft. 7 in. thick, and is worked by the long-wall system. The roof consists of hard close-grained freestone, and generally the "brushing" is taken out of the floor or pavement. The ironstone ("Bantone") is 12 inches thick, the height of working 2 feet, and the mode of exhaustion long-wall.

The ventilation was maintained by two furnaces, each 4½ feet wide, with 6-feet bars placed near to the bottom of No. 1 pit. The total quantity of air produced was upwards of 40,000 cubic feet per minute. The following are the total quantities measured on various occasions by Mr. Ronaldson, assistant inspector:—On 2nd September 1875, 25,000 feet; on 12th January 1876, 30,625 feet; and on 11th April 1877, 42,000 feet. At the time of the last visit, on 29th January 1878, the distribution of the air was arranged as follows:—15,550 cubic feet passed down the main coal dook A, and a certain amount of leakage was permitted to pass through the screens placed on the various branch roads leading off on each side of it. The air reaching the bottom of the dook was split right and left, and passed up the working faces. That on the north-east side, after ventilating the places there, was joined by a split of 6,300 feet, going in the north-east level from the pit bottom, and had only to supply one working-place immediately to the rise of the level before passing along the range of abandoned workings lying between the level and the upcast. The other half of the split, after serving the south-west side, was joined by a scale of air from the pit bottom; the two combined, amounting to 7,430 feet, went to ventilate the present ironstone workings. The small-coal working marked B, at the time being opened up, was ventilated by an independent split of 5,230 feet. These sections of working are "win" off the coking coal by the mines R, S. The remaining air, reported 9,000 feet, was used to keep in a safe state the abandoned section of the "Bantone" ironstone working north of the 17-fathom dislocation, the return from which was by the "blind" pit D, into one of the main air-courses in the coal, and thence direct to No. 1 pit. The "waste" in the "Gartshore" ironstone was built off, and remains in the same condition.

The main coal dook A dips at an inclination of one in six and a half, or thereby. Six "walls" were being worked on each side of this, but in no case was the proximity closer to the face of the dook than the points *a*, *b*. Adjacent to this a mine, C, was being driven towards Haugh Pit, for the purpose of forming a communication or outlet for it. There was also a branch road off this mine, and the total number of workers in that section was 27. The small-coal dook B was just being opened up; the working-places were one heading and two levels. The ironstone working comprised 12 walls, and the number employed in this and the small-coal dook B combined was 42.

The coal seam has always been known as fiery, but since a communication was formed with No. 1 pit, safety lamps were discarded, and, unless under special circumstances, naked lights were used.

It appears that the fireman descended the pit at 8 p.m. the night previous to the accident, and examined the workings before allowing the "brushers" (night workmen) to commence work; and again on the following morning, about 3 a.m., before admitting the day shift. After his examination, it appears, he went to the pit head and reported to the day fireman that he had found all right, after which he signed his report book and went home.

The workmen, to the number of 80, admitted by the day fireman, having all descended by 6.15 a.m., continued to work without any suspicion of danger until about two hours after, the ventilation being apparently as usual, and it may be assumed that the mine was in its ordinary condition.

According to the statement of several survivors, the first indication of anything wrong was a slight blast, while others experienced a stoppage or check, and then a reversal of the air. Almost immediately the bottom of the downcast became enveloped in flame, and a strong current of air rushed up it The appearance at the surface, as described by the pit-head man,

was first the emission of a gaseous production from No. 2 pit, such as might proceed from the ignition of a small quantity of gunpowder, which was immediately followed by a slight discharge of steam up the dip end of the shaft, and then by steam and black smoke from both ends.

In the meantime the miners, having discovered some derangement in the ventilation, rushed towards the pit bottom. Those in the ironstone and small dook B workings, finding they could not escape up No. 2 shaft, assembled at the point E, and after some delay were conducted by the oversman up the south-west air-course to No. 1 pit, and reached the surface in safety. Some of the workmen in the main coal dook A, upon feeling that the air had reversed, appear to have run out from their working-places to the dook road, and attempted to get to the pit bottom, but finding fire raging, and no exit that way, they, twelve in number, after more than once attempting to escape by passing the pit, proceeded in the dark from N up the face F to the point O.

As soon as it became known that an explosion had taken place, there was no lack of willing and earnest explorers, some of whom reached No. 1 pit and were lowered into the mine within a short time of the occurrence. Their efforts, after it was explained that those who worked in the ironstone and small coal dook B had escaped, were directed to the main dook A. Any attempt, however, to advance in that direction was difficult and dangerous, in consequence of the fire raging round the bottom of No. 2 pit, and the reversed air now passing down No. 1 pit, carrying the products of combustion from the furnaces along with it. Ultimately, on finding that the entrance by No. 2 pit bottom was closed, they advanced by "Crawford's" dook, and, on reaching the bottom of it, met the persons already referred to at the point O, but did not proceed farther. They then retraced their steps, taking the rescued men with them, when on reaching the north-east level, they were joined by the boy Fleming (now deceased), who worked the dook engine at the pit bottom, and who, in endeavouring to escape, had got his clothes burned off. They all proceeded to the surface, with the exception of two who were to remain until further assistance should be sent. But in about fifteen minutes an explosion took place which put out their lights, and they, becoming alarmed, returned to No. 1 pit bottom, where they met with assistance. After putting out the furnaces a party of explorers, headed by men thoroughly acquainted with the mine, proceeded down the dook X, but they were unable to go beyond the point T because of the damp, which was so strong that they could not enter it. From some cause, probably a partial closing of the bottom of No. 2 pit, the air current was now almost stagnant, and water was forced down to accelerate a circulation in the direction of No. 2. Returning to the bottom of No. 1 pit, the party next attempted to approach by the south-west level, and down the south-west air-course, but upon reaching the point W another explosion took place, and, considering it unsafe under the circumstances to go farther, they returned to No. 1 pit. A party afterwards essayed an entry by the same road and reached the point Y, where the air was so charged with damp as to prevent them from proceeding farther, and a return was again made to No. 1 pit. An attempt was also made to go in by the mine V close to No. 1 pit, but the foulness of the air prevented a passage from being effected that way. It may be stated that from this time, five or six hours after the accident, when the foul air reached near to the bottom of No. 1 pit, the explorations, though not abandoned, were carried on less hopefully. I was unwell at the time of the occurrence and unable to attend, but Mr. Moore, on my behalf, went to the mine on the evening of the day of the accident, and, with Mr. Ronaldson, co-operated with those responsible for the management, and was in constant attendance until after all hopes were given up of rescuing anyone alive.

Varied schemes were devised and efforts made to effect an entrance by No. 2 pit. Water was poured down it, and jets of steam were introduced into No. 1. There being a midwall in each shaft, it was found that the air was going down one division and up the other in both. After the steam and water jets had been in operation for some time, and this state of matters still continuing, doubts were entertained of there being any circulation of air in the workings. The mouth of the downcast division of No. 1 and the upcast division of No. 2 were then boarded over, when three-quarters of an hour afterwards an apparent current of air between the two shafts was established. It was considered advisable to leave matters alone for some time, but after four hours there was little or no improvement, and smoke was frequently seen issuing from the downcast division of No. 2 pit. Experiments were made to ascertain if there was any obstruction in No. 2, when it was found that a weight could not be lowered within a few fathoms of the bottom. On the 9th a descent was made in a "kettle" in No. 2 pit to within 17 fathoms of the bottom, when about 9 feet of barring was found to be insecure, the midwall having been burned out, and it was deemed advisable to repair it. With the view of reaching the workings as early as possible an attempt was made to utilzie the air going off at the "Bantone" ironstone and down the blind pit D to the coal, and at

the same time taking down a water jet to extinguish the fire which it was expected would be encountered. Having reached the ironstone on the 10th a trial was made to get to the blind pit D, but the air was found to be stagnant, and the explorers were unable to reach it. After giving up the idea of entering by the blind pit, there was nothing left but to repair No. 2 shaft, clear it out, and open a communication with the coal workings, where the unfortunate sufferers lay. While this was going on, however, another effort was made to enter by the No. 1 pit, which was made self-ventilating, and considerable progress was made until early on the morning of the 14th, when the explorers had to retreat hurriedly in consequence of an explosion. Operations were then suddenly stopped, and from the numerous explosions which followed, those in charge were convinced that the workings were then on fire. A special meeting of engineers to advise with the managers was called, at which I was present, when the case was fully considered, and the following declaration issued:

"In attempting to enter the Barwood pits it has been found that the mines are filled with "foul air, and that the workings are burning, as indicated by the explosions which have "taken place since an early hour this morning. We, having carefully and anxiously con- "sidered the state of matters, have come to the conclusion that none of the imprisoned miners "can now be alive, and that any farther attempt to enter the workings would in every "probability result in a greater loss of life. We resolve that the only course left is to shut "up the mines until the burning is extinguished, and we have arrived at that conclusion "with a full appreciation of the painful feeling which it will no doubt awaken in the minds "of the suffering relatives."

The mine was accordingly closed on the sixth day after the accident. It took four weeks to flood it to the required level, 17 or 18 fathoms above the bottom of No. 2 pit. On the 15th of April, when it was supposed that the fire was extinguished, pumping operations were commenced. As the unwatering of the mine progressed the shaft was found to be much damaged, and required to be thoroughly overhauled, and the workings and roadways from falls of roof, swollen pavement, &c. were also in a bad condition. The bodies were found at the points indicated by the figures marked on plan of the coal workings, the last of them on the 10th of September.

As to the disaster, all the evidence obtained from the survivors and others fails to throw much light upon the origin or cause, and the mine being flooded for months after the accident obliterated what evidence might have been obtained by an earlier investigation. It is clear that an explosion, not severe, took place near to the bottom of the dook A, probably at or near C. Out of 27 men who worked in this section 12 escaped; of these six were burned, some of them slightly, and the others were uninjured. Those found at 5, 6, and 7, had apparently been struck down or suffocated suddenly, as they were found near to the places where they had been at work. The others were all found out of their working-places. Those at 2 worked near to *h*; they had travelled a greater distance than the others, and must have reached the place where they were found perhaps an hour after the accident. It is not certain that the explosion preceded the conflagration at the bottom of No. 2 shaft, or yet caused it. But if the conflagration preceded the explosion it may have been the indirect cause of explosion by exhaustion and liberation of the gases there, at C. If, however, the explosion in the dook happened before the outbreak of fire in the shaft, the question arises, where did the firedamp, which is supposed to have caused the burning, come from? It is difficult to conceive that it could be caused by the explosion, because one of the workers who was burned very slightly at P saw no flame. Two burned at or near *f* saw no flame, and two uninjured, working at F, saw no flame, but felt two slight blasts, the last of which put out their lights. One of the last referred to says: "We went out to our bench at N, "afterwards up to the pit bottom, and found flames extending all round it. There was no "way of getting out in that direction. We returned to the bench N, and, after remaining "there a little, went back again to the pit bottom; we endeavoured to get a light at some "burning wood, but failed, came back to N, and went along the faces with others to the "point O, where we met the explorers. None of us thought of proceeding down the "dook A to intimate the state of things to the men working there. The air was tolerably "good all the time we were moving about, but we had no light."

So far as is known, there was no "standing" fire or accumulation of firedamp in any part of the mine. The abandoned ironstone waste at 14 fathoms above the bottom of No. 2 pit was the only place where, at the time, gas might have been expected to exist. But it is so far satisfactory that less than an hour before the accident happened one of the assistant bottomers had been in it, and found the air apparently fresh. He had occasion to go a short distance to the "rise" to lift rails of a special kind to be employed in the coal workings and used a *naked light*. One of the regular bottomers who had been raised to the surface a few minutes before the accident, and was returning, says, "I observed a reversal of the air

" just as the cage was approaching the bottom, and on reaching it I found myself surrounded " by flame. It seemed to fill the mouth of the N. E. level from roof to pavement. I lay " down at the low side of the level near the entrance to the dook A, the flame all the time " rushing over me and into the shaft. Upon seeing a sort of lull in the flame I ran across " and lay down at the foot of the heading in the fresh air which was blowing strong into " No. 2 shaft, the door *d* being partly open."

Feeders of gas are sometimes met with in this locality. As an illustration, the oversman explained that "on cutting the cross-cut mine R to open up the small-coal dook B, an " unusual discharge of gas was encountered at the point K, which was ignited by the naked " lights of the miners, and continued to burn for nearly an hour before it was extinguished. " The discharge continued at that point until the mine was extended twenty fathoms farther " to L, when a fresh feeder, the blast from which was sensibly felt at a distance back from " the point of issue, threw up the floor and displaced the strata to a depth of nine feet, and " the growth of water, which was considerable, and had previously been drawn by large water " chests, passed off freely through the opened fissures for five days after."

Keeping this in view it is not improbable that a discharge of gas near to the shaft occasioned the burning *there*. There was no evidence of such a discharge, but it is conceivable that it may have taken place under the existing condition of the mine. The dook workings A were approaching "Haugh" Pit, lately sunk to the dip of them, where of necessity the strata must have been *bled* or unwatered to a considerable extent. With the withdrawal of the water space would be afforded for the collection of lighter gases; these would naturally ascend and lodge in the strata until forced out or liberated by a "break" or fracture, produced by the natural subsidence to which all long-wall mining is subject.

This is a somewhat unsatisfactory finding, but the investigation and inquiries made by Mr. Moore and myself did not warrant us to arrive at a more definite conclusion. Since the accident the mine has been worked with locked safety lamps.

A fund was raised for the benefit of the bereft, nine widows and 29 child en. It is managed by gentlemen connected with the district, who pay 5*s*. weekly to each widow, and allow 2*s*. for each child. The fund is supposed to be ample to meet all future requirements.

The second happened to a fireman who, at the time of the accident, it is understood, was examining the mine before allowing the workmen to enter to their work, when he exploded a small quantity of firedamp which had collected in a part of the air-course a little above the ordinary level of the roof.

The amount of firedamp was trifling, and the injuries which caused death 12 days after were at the time not considered serious. It was stated that this was the first time firedamp had been discovered in the mine, and that at the time of the explosion the deceased was making his examination with an open light.

The third happened at a shaft in the act of being sunk as an outlet for one adjoining. No. 1, the first, reached the "main" coal at a depth of 54 fathoms. The workings in it are yet of a preparatory kind, the principal one being a mine driven towards and under the shaft No. 3 in the act of being sunk, and which eventually will form the course of communication between them. At the time of the accident the sinking pit had reached 37 fathoms from the surface. It appears that at a depth of 16 fathoms a bore-hole was put down to the mine in the main coal off No. 1 pit, for the purpose of drawing the water off No. 3, and to the bottom of No. 1, where arrangements were made for pumping it. In prosecuting the sinking of No. 3 pit, feeders of firedamp were opened about 30 fathoms from the surface. These feeders have continued to give off gas, more or less, from the time they were first opened. Firedamp also escaped by the bore-hole referred to, if at any time it got choked or the water did not run off freely.

The ventilation was maintained in the ordinary way by a midwall, which at the time of the accident reached to within 22 feet of the bottom of the shaft, and a current of air, beyond the natural ventilation, was produced by the occasional use of a jet of steam placed in the upcast division about seven fathoms from the surface. It appears that from the 8th of July the night shift of men worked with safety lamps, but during the day the workmen could carry on their operations without the aid of lamps.

Blasting operations were carried on without lights, and the shots were fired by applying heated iron rods to the fuse or match. Dynamite was the explosive in use at the time of the accident.

The work was carried on by three shifts of men in the 24 hours, and five men were engaged on each shift. On the day of the accident, 20th July, the afternoon shift commenced at two o'clock, and up to the time of the accident, about six p.m., they had prepared six bore-holes and were making preparations to blast. Two of their number had gone to the surface, and by arrangement sent down in the return kettle two hot irons to be used for igniting the fuse attached to each shot. The kettle was lowered properly, and the usual signal was after-

Plan
of part of
KILKEEVAN COLLIERY
N°2 Pit.

The part coloured Blue shews what was supposed to be the limit of the working of the Six Feet seam to the North.
The part coloured Yellow shews the actual position as proved since the accident.
The part coloured Red shews the workings in the Nine Feet seam from Kilkeevan N°2 Pit at the time of the accident.

Scale 1 Inch = 3 Imperial Chains

William Alexander

Insp^r of Mines.

Dangerfield, Lith. 22, Bedford St Co

wards given from below that they were ready to blast. The engineman acknowledged the signal, and in a few seconds after an explosion took place, which cleared out the midwall in the shaft, and carried away part of the pit-head frame and other woodwork near to the mouth of the pit. The displacement of the midwall, part of which kept the "barring" in its place, was followed in less than two hours after by the surface forcing in the "barring," and a mass of earth, &c., probably from 3,000 to 4,000 cubic feet, fell down the shaft, completing the wreck and thoroughly shutting off all communication. As explained, previous to the accident the water passed from the sinking shaft by the bore-hole, but after the accident the bore-hole was closed and machinery had to be erected to pump it. To do this and secure the shaft occupied a considerable time.

After access was got to the bottom and the bodies recovered, it was found that of the shot-holes, six in number, which were prepared, three had been exploded, two had been ignited at the fuse, not exploded, and one remained entire, the fuse still showing that it had not been lighted.

This unfortunate occurrence appears to have been occasioned by a small accumulation of gas near the bottom of the shaft; and, as it is understood there were no lights in it at the time, the direct cause of explosion is limited either to the ignition of the fuse or the flame from the blast. There is good reason for supposing that none of the shots were exploded till after the accident, therefore the assumption is that the ignition of the fuse caused the explosion of firedamp. I do not suppose that the gas existed in an explosive state from the bottom up, but rather that a little firedamp passing off at the bore-hole was ignited by a fuse, the flame from which extended to the feeders about five fathoms up.

By general rule No. 8 of the statute after inflammable gas has been found, and for three months after by sub-section 1, it is provided that "A competent person who shall be appointed "for the purpose shall, immediately before firing the shot, examine the place where it is to "be used, and the places contiguous thereto, and shall not allow the shot to be fired unless "he finds it safe to do so, and a shot shall not be fired except by or under the direction of a "competent person who shall be appointed for that purpose."

The precautions provided by this important regulation do not appear to have been observed fully in this case.

The fourth was occasioned by the deceased entering, inadvertently, a part of the mine not at the time in course of working or extension, and igniting some firedamp which had collected in it. The injuries he received were thought to be slight, but he died from the effects a few days after.

The Procurator Fiscal charged the fireman in this case with failing to observe the 4th general rule, the observance of which was binding upon him by special rule No. 38. The case was tried before the Sheriff Substitute in Ayr, when the charge was found not proven.

The accidents from falls of coal and roof are of a class that do not seem to be much affected by the changes introduced to lessen them. It is wholly a question of inserting artificial supports to maintain the roof, after the natural support has been taken away, and a judicious introduction of building and propwood is all that the most attentive can do. The idea of only applying supports *when* required, does not always prove effectual, in consequence of the lurking unseen dangers arising from "lypes" and otherwise. A systematic plan of supporting the roof appears to me the most effective method of reaching this particular class of accidents, and by some approved rule let a given amount of support be placed in a given area.

In shafts the accidents have been fewer than in any previous year; the result is satisfactory, and the following statement, which shows the accidents in shafts since 1872, seems a convincing proof of the good effects of the prudent provisions of the late enactment relating to fencing and protecting shafts, &c. at "the top, and all entrances between the top and bottom."

Accidents in Shafts since 1872.

1872.	1873.	1874.	1875.	1876.	1877.	1878.
19	17	13	12	8	8	6

Of these accidents three at least might have been prevented. The first happened when three workmen were about to be lowered to their work. After going on to the cage in the usual way, it appears that instead of being lowered they were raised to the pulleys, where in some way the cage was stopped, either by the engineman discovering his mistake and checking it, or by the resistance of the crossbars on which the pulleys rested. The deceased, who, I

understand, was more alarmed than his companions, on finding the cage being raised, leapt off it on to the plates at the pit mouth, from which he fell into the shaft, and was killed; but those who were with him remained on the cage, and ultimately succeeded in getting off safely. The engineman was charged by the Procurator Fiscal with culpable neglect of duty, was tried by the Sheriff Substitute in Airdrie and a jury, found guilty, and fined twenty pounds,—failing payment, imprisonment.

The second occurred at a mid-working, the victim being a bottomer, who at the time was engaged pushing a hutch of coals towards the shaft, for the purpose of putting it on the cage; in some way he failed to observe that the cage was not in its place to receive it, and the consequence was that the hutch fell down the shaft, he falling with it, a distance of 12 fathoms. There was a door close to the side of the shaft, which the deceased required to open before he could get to the cage, and in opening it he ought to have seen whether the cage was in its place before pushing the hutch forward. This apparently he neglected to do.

Certain simple contrivances have been introduced for the prevention of such accidents, the most effective of which when closed acts as a scaffold, and when open as a fence.

The third happened to a sinker whilst engaged upon a scaffold about eight fathoms from the bottom of the shaft, through gross mismanagement, in attempting to ungear a crane whilst in motion.

From miscellaneous accidents, seven in number, nine lives were lost: two by the explosion of gunpowder whilst blasting; two on inclined planes; two by trams and tubs; and one by an irruption of water. The pit at which the irruption took place is 27 fathoms deep, and was suddenly filled to within 12 fathoms of the surface. The old workings, from which the water flowed, are of considerable extent, but have been abandoned for upwards of 50 years. Referring to plan which exhibits the workings of two seams of coal, the first six-feet seam, coloured blue, lies at 18 fathoms from the surface, and the lower or nine-feet seam, coloured red, at 27 fathoms. At the time of the accident the working was confined to the lower seam. The depth of surface overlying the stratified rocks, lying not far above the sea level, averages 54 feet, of which 40 is principally composed of sand. Several dislocations traverse this part of the coalfield, and the fracture, or "veise," is generally found filled with sand. In mining up to these fractures, or barring them, there is frequently a partial discharge of water, which is looked upon as quite an ordinary occurrence. In May last the place marked × on plan, when extended to the dislocation *a a*, relieved some pent-up water, to check which supports were immediately put to the roof, and a rough dam constructed, backed by a loose building. This had the desired effect of shutting off the water, and the place was supposed to be left in a secure state. Nothing further was done until the 5th of July, when the manager had occasion to be in or to pass near to the mine ×, when he discovered water and sand passing from the front of the dam. On observing this, precautionary measures were taken, which were completed before night. No further discharge was observed up to the time of the disaster, which happened on the afternoon of the following day, 6th, when the water which lay in the six-feet seam found its way into the mine × by the "veise" of the dislocation *a a*. The pressure of the water, probably equal to 100 feet or thereby, forced away the obstruction at ×, and made an opening down the veise of the dislocation 25 feet and 4′ × 10′, in which it must have rushed with considerable force. The bottomer, who was employed at the bottom, was so suddenly overtaken that he did not escape, and two of the miners working at B, the dipmost part of the mine, were, I presume, instantly closed in, their bodies being afterwards found near to their working-place. Fortunately the work was nearly over for the day, and five workmen engaged at different parts of the mine escaped by the "blind" pit.

The appliances for pumping the water and unwatering the mine were kept in constant operation, but the bottom was not reached until the 2nd of September, when the body of the bottomer was found, and nearly four weeks elapsed before the bodies of the others were reached. The works were conducted or guided by an old plan, which is now found to be in error at least 46 fathoms, or rather the workings have been extended 46 fathoms beyond the limit shown upon the plan, where it is coloured yellow.

The existence of water in the old workings was well known, but it was equally well known that it lay from 25 to 30 feet above the seam being worked. Since the accident a mine has been driven to prove the actual position of the old waste. This is a very unusual accident, the displacement of at least 25 feet of material, 4′ × 10′, more or less consolidated, and could only have happened under special conditions. The salutary provisions contained in section 42 of the statute, which provide that plans of abandoned mines shall be lodged with the Secretary of State within three months after the abandonment, will in future tend to prevent such misfortunes.

On the surface four accidents took place, resulting in the loss of four lives; two workmen were run over by waggons, and two were crushed by machinery.

For further details as to the accidents not particularized in the foregoing observations I beg to refer to Schedules 1 and 2, where a brief explanation is given of each.

The non-fatal accidents, in number 161, appear to be gradually decreasing, and, as compared with earlier years, when it became incumbent upon the owners of mines to report such accidents, show a satisfactory diminution.

Year.	Explosions.	Falls of Coal and Roof.	Shafts.	Miscellaneous.	Above Ground.	Total.
1862	84	85	11	35	6	221
1863	88	97	10	38	6	239
1877	33	90	12	31	12	178
1878	38	67	10	35	11	161

In accordance with your instructions the dates on which explosions took place are given in Appendix 1; but I am unable to give the dates "on which mines have been in a "dangerous state from the abundance of gas without explosion occurring," or whether such a state of things did exist.

The system of examination for granting certificates of competency appears to me to require consideration. As at present carried out, an applicant is allowed to go from the district where he practises and is known into any other district, and be examined according to the regulations laid down by the Board of Examiners there. In November last 49 candidates presented themselves before the Examiners here; of these 40 were from Scotland, and nine from different parts of England; and in one unfortunate case a candidate from England appeared in a state unfit to be examined.

It would not be desirable to place difficulties in the way of persons desirous of qualifying themselves to take the management of mines, but, apparently, it would be prudent to adopt some restrictive measure, which would give greater confidence to those intrusted with the duty of not only testing the candidates' ability relating to mining, but who have to take into consideration certificates of character, and capabilities otherwise. This cannot be done in all cases, as at present, when candidates present themselves from distant parts, the difficulty is to obtain in time satisfactory information upon all the points on which information is required; and the responsibilities now undertaken by those intrusted with the management of mines are too weighty to be lightly considered.

I do not think it would inconvenience candidates to limit their examination to the district in which they had practised, or to the one adjoining. It seems inexplainable that men should come from Yorkshire and other distant parts, when equal facilities and opportunities can be had either there or in the immediate neighbourhood.

The inspection of the district has been carried out by Mr. Ronaldson and myself very much in the manner before reported. Jointly we have made 431 visits of inspection, 218 of which were underground; attended meetings, and engaged at court, &c. with business relating to inquiries and prosecutions 44 days, made upwards of 200 reports, travelled 17,932 miles by rail and otherwise, investigated all complaints, and kept up the necessary correspondence, which is now both varied and extensive.

For the past year the METALLIFEROUS mines have again been worked without the occurrence of any fatal accident.

The persons employed were as under—

Underground.				Above Ground.—Ages							Total Underground and above Ground.
Male Persons.—Ages				8 to 13.		13 to 18.		Above 18.		Total.	
12 to 13.	13 to 16.	Above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.		
—	7	484	491	—	—	68	2	2	213	285	776

and the produce of their labour, lead, zinc, iron ore, gannister, building stone, and limestone, amounted to 152,551 tons.

Lead.	Zinc.	Iron Ore.	Gannister.	Building Stone.	Limestone.
Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1,824	235	7,568	1,071	47,943	93,910

I have, &c.,
WILLIAM ALEXANDER,
Inspector of Mines.

To the Right Hon. R. A. Cross, M.P.,
Principal Secretary of State,
Whitehall, London.

SCHEDULE No. 1.

MINES CLASSED UNDER THE COAL MINES REGULATION ACT.

LIST of the FATAL ACCIDENTS in COAL MINES, and Loss of LIFE arising therefrom, in the WESTERN MINING DISTRICT of SCOTLAND, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Jan. 26	1	Drumpeller, No. 4	Coatbridge	Henderson and Dimmack	Patrick Griffen	Collier	25	Fall of coal	–	1	–	–	–	1
„ 31	2	Braehead, No. 6	Lugar	Eglinton Iron Co.	John Carlin	Ditto	50	Fall of roof	–	1	–	–	–	1
„ „	3	Lanemark, No. 1	N. Cumnock	Lanemark Coal Co.	Alex. McStephney	Ditto	19	Run over by a hutch upon an incline	–	–	–	1	–	1
Feb. 11	4	Bankhead	Sanquhar	Misses Whigham	Archd. Crichton	Ditto	29	Fall of roof	–	1	–	–	–	1
„ 26	5	Bogleshole, No. 4	Tollcross	James Dunlop and Co.	Andrew Jamieson	Ditto	53	Ditto	–	1	–	–	–	1
„ 28	6	Dalharco, No. 2	Dalmellington	Dalmellington Iron Co.	Alex. M. Cracken	Ditto	45	Fall of coal	–	1	–	–	–	1
Mar. 6	7	Caprington, No. 31	Kilmarnock	W. S. Cunningham	Adam Sawyers	Ditto	41	Fall of roof	–	1	–	–	–	1
„ „	8	Bogside	Kilwinning	Eq. Iron Co.	William Burns	Ditto	35	Ditto	–	1	–	–	–	1
„ 8	9	Barrwood, No. 2 pit.	Islsyth	Wm. Baird and Co.	Alex. Burns	Bottomer	34	By fire in shaft and explosion of firedamp.	17					17
					James Wardrope	Collier	52							
					James Wardrope jun.	Ditto	16							
					David Wardrope	Ditto	20							
					David Gould	Ditto	19							
					Alex. Ross	Ditto	40							
					James Ross	Ditto	15							
					John Miller	Ditto	35							
					William Cameron	Ditto	44							
					James Cameron	Ditto	15							
					James Gould	Ditto	45							
					George Young	Ditto	34							
					Robert White	Ditto	24							
					Walter Ralston	Ditto	30							
					Edward Hardie	Ditto	38							
					Walter Cowan	Incline Man	32							
					David Fleming	Engine Boy	17							
„ 18	10	Auchinharvie, No. 5	Saltcoats	M. Cunninghame	John Finlay	Brusher	51	Fall of roof	–	1	–	–	–	1
Apr. 10	11	Springside, No. 10	Dreghorn	A. Kenneth and Sons	Robert Hay	Collier	26	Fall of coal	–	1	–	–	–	1

List of the Fatal Accidents, &c.—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Apr. 23	12	Galston Colliery -	Galston -	J. Horne and Sons -	Hugh Richmond -	Pony Driver	16	Fall of roof - - - -	–	1	–	–	–	1
May 1	13	Knockterra -	Cumnock -	Eg. Iron Co. - -	Patrick Cairns -	Hillman -	21	Was run over by a waggon he was in the act of shifting.	–	–	–	–	1	1
„ 24	14	Spitallhill, No. 2 -	Cambuslang -	Clyde Coal Co., Limited -	Richard Shannon -	Labourer -	38	By a crane getting unexpectedly into motion.	–	–	–	–	1	1
June 6	15	Hallhill - -	Baillieston -	Springhill Coal Co. -	William Guthrie -	Collier -	37	Fall of roof - - -	–	1	–	–	–	1
„ 10	16	Loudon, No. 1 -	Galston -	Eg. Iron Co. - -	Robt. Wilson -	Pony Driver	14	Had fallen before a train of loaded hutches which he was in charge of.	–	–	–	1	–	1
„ 17	17	Ayr Colliery -	Ayr - -	J. T. Gordon - -	John Kerr -	Collier -	20	Fall of coal - - -	–	1	–	–	–	1
„ 22	18	Pollok Colliery -	Pollokshaws -	John Wilson - -	James Whitehill -	Fireman -	43	Explosion of firedamp. Injured on the 10th, died on the 22nd.	1	–	–	–	–	1
„ 25	19	Caprington, No. 37	Kilmarnock -	W. S. Cunningham -	John Miller - -	Roadsman -	74	Fall of roof whilst engaged securing it.	–	1	–	–	–	1
July 6	20	Drumlemble - Kilkeevan Pit.	Campbelton -	Argyle Coal and Cannel Co.	John Todd - -	Bottomer -	64	Inundation from an old abandoned working.	–	–	–	3	–	3
					Daniel McPhail -	Collier -								
					Neil Smith - -	Ditto -								
„ 15	21	Lanemark, No. 1	N. Cumnock -	Lanemark Coal Co. -	James Ferguson -	Ditto -	41	Whilst blasting - - -	–	–	–	1	–	1
„ „	22	Gauchalland, No. 4	Galston -	Gauchalland Coal Co. -	John Roxburgh -	Ditto -	28	Fall of roof - - -	–	1	–	–	–	1
„ 17	23	Drumpark - -	Baillieston -	Drumpark Coal Co. -	Henry Laughlan -	Ditto -	24	Ditto - - -	–	1	–	–	–	1
„ 20	24	Wester Gartshore	Kirkintilloch -	J. and A. Wallace -	James Harper -	Sinker -	31	Explosion of firedamp - -	3	–	–	–	–	3
					Edward Griffin -	Ditto -	26							
					Robert Gray -	Ditto -	23							
Aug. 5	25	Britton Pit -	Coatbridge -	W. S. Dixon - -	Andrew Anderson	Pumper -	60	By being drawn to the pit-head pulleys, from which he leapt and fell into the pit.	–	–	1	–	–	1
„ 6	26	Souterhouse -	Ditto -	Pettigrew and Spencer -	Kennedy Moffat -	Stoker -	15	Was run over by a full waggon when interfering improperly with it.	–	–	–	–	1	1
„ 15	27	Gauchalland, No. 4	Galston -	Gauchalland Coal Co. -	John McGhee -	Collier -	50	Fall of coal - - -	–	1	–	–	–	1
„ 22	28	Hawhill - -	Baillieston -	Pettigrew and Spencer -	Alex. Robertson -	Bottomer -	62	By the cage being lifted unexpectedly.	–	–	1	–	–	1

List of the Fatal Accidents, &c.—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Aug. 22	29	Gilmilnscroft -	Auchinleck -	Gilmour, Wood, and Anderson.	James Baxter -	Collier -	50	Explosion of firedamp - -	1	–	–	–	–	1
Sept. 4	30	Bonnyton, No. 6.	Kilmarnock -	John Gilmour and Co. -	Andrew Guthrie -	Bottomer -	44	Fell down the shaft - -	–	–	1	–	–	1
„ 6	31	Souterhouse, No. 2	Coatbridge -	Pettigrew and Spencer -	Wm. McAlinden -	Collier -	22	Fall of coal - - -	–	1	–	–	–	1
„ 19	32	Farme - -	Rutherglen -	James Fairie - -	David Anderson -	Ditto -	52	Fall of roof - - -	–	1	–	–	–	1
Oct. 12	33	Maidenbank -	Muirkirk -	Eg. Iron Co. - -	Robt. McCall -	Ditto -	39	Ditto - -	–	1	–	–	–	1
Nov. 1	34	East Plean - -	Bannockburn -	Paterson and Thomson -	Thos. Morrison -	Assistant Pit-headman.	21	Crushed by grinding machinery -	–	–	–	–	1	1
„ 7	35	Burnbank and Ladyton.	Galston -	Boyd, Gilmour, and Co. -	Allen Roxburgh -	Collier -	17	Fall of roof - - -	–	1	–	–	–	1
„ 9	36	Wellshot - -	Cambuslang -	Dunn, Brothers - -	Lawson Crichton -	Ditto -	50	Was struck by a crane rope falling down the shaft.	–	–	1	–	–	1
„ 15	37	Auldhouseburn -	Muirkirk -	J. C. Simpson - -	John Gemmell -	Ditto -	40	Fall of coal - - -	–	1	–	–	–	1
„ 20	38	Flemington, No. 1	Cambuslang -	Flemington Coal Co. -	Matthew Robertson	Ditto -	35	Ditto - - - -	–	1	–	–	–	1
„ 21	39	Eastfield - -	Ditto -	T. G. Buchanan - -	Robert Tennent -	Ditto -	63	Whilst blasting - - -	–	–	–	1	–	1
„ 23	40	Jellieston, No. 2 -	Dalmellington	Dalmellington Iron Co. -	Robert Burges -	Ditto -	63	Run over by a hutch upon an incline.	–	–	–	1	–	1
Dec. 6	41	Maidenbank -	Muirkirk -	Eg. Iron Co. - -	Thomas Baird -	Collier -	40	Fall of roof - - -	–	1	–	–	–	1
„ „	42	Govan, No. 6 -	Glasgow -	W. S. Dixon, Limited -	Francis Fox - -	Brusher -	43	Ditto - - - -	–	1	–	–	–	1
„ 16	43	Bellfield, No. 1 -	Hurlford -	Bellfield Colliery Co. -	James McNeil -	Pitheadman	33	By cage holding in the shaft and afterwards falling away.	–	–	1	–	–	1
„ 24	44	Drumpeller, No. 5	Coatbridge -	Drumpeller Coal Co. -	John Ferries -	Collier -	25	Fall of coal - - - -	–	1	–	–	–	1
								Total for 1878 - -	22	25	5	8	4	64

L 2585.

SCHEDULE No. 2.

Mines classed under the Coal Mines Regulation Act.

List of the Fatal Accidents in Ironstone and Fireclay Mines, and Loss of Life arising therefrom, in the Western Mining District of Scotland, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
June 28	1	Blackstone, No. 1	Cumnock -	Eq. Iron Co. - -	John Hughes -	Miner -	34	Fall of roof - - -	–	1	–	–	–	1
July 6	2	Bishop Briggs, No. 8.	Bishop Briggs	W. S. Dixon - -	Hugh McVey -	Ditto -	23	Ditto - - -	–	1	–	–	–	1
Sept. 7	3	Corby Craigs, No. 2.	Dalmellington	Dalmellington Iron Co. -	John Malone -	Sinker -	33	Fell from a scaffold, which was knocked out from under him by a buntin whilst being drawn up the shaft.	–	–	1	–	–	
Dec. 4	4	Clippins - -	Paisley - -	Clippins Oil Co. - -	William Dodds -	"Runner" -	22	Fell from a scaffold to the surface -	–	–	–	–	1	1
„ 27	5	Muirhouse, No. 2	Beith - -	M. Cunninghame -	Jas. McKendrick -	Drawer -	12	By hutches - - -	–	–	–	1	–	1
								Total for 1878 - -	–	2	1	1	1	5

APPENDIX 1.

Showing the Dates on which the Non-fatal Explosions of Firedamp and the Non-fatal Falls of Coal and Roof occurred during 1878.

Day of month.	January.		February.		March.		April.		May.		June.		July.		August.		Sept.		October.		Nov.		Dec.	
	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.	Explosions.	Falls of roof.
1	–	–	1	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
3	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	1	–	–	–	–
4	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
6	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
7	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–
8	1	1	–	–	1	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–
9	–	–	–	–	–	–	–	–	–	1	–	–	1	1	–	–	–	–	–	–	–	–	–	–
10	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	1	–	1	–	–	–	1
11	–	–	–	1	–	–	–	1	–	1	–	–	–	–	–	1	–	–	–	–	1	1	–	–
12	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	1	–	–	–	–	1	1	–	–
13	–	–	–	1	–	–	–	–	1	1	1	1	–	–	1	–	–	–	–	–	–	–	–	1
14	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
15	–	1	–	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–	1	–	–
16	–	–	1	–	–	–	1	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–
17	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	1	–	–	–	–	–	–	–
18	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
19	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
20	–	–	–	–	–	1	–	–	–	–	–	2	–	–	1	–	–	1	–	–	–	–	–	–
21	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	3	–	–	–	–	–	–	–	–
22	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
23	–	1	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	1	–	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
25	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	1	–	1	–	–
26	–	1	–	–	2	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
27	–	–	1	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
28	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
29	–	–	–	–	–	–	–	2	–	1	1	–	–	–	–	–	–	–	–	–	–	1	–	–
30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
31	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
	3	6	3	5	5	4	2	6	3	9	4	6	2	4	5	7	4	3	4	6	2	8	1	3

Explosions	36
Falls of roof	67
In shafts	10
Miscellaneous	35
Above Ground	11
Total	161

List of Mines classed under the Coal Mines Regulation Act, in Mr. William Alexander's District, 1878.

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	LANARKSHIRE COLLIERIES.			
	Glasgow District.			
1	George Crookstone, Crosshill, Glasgow.	Aitkenhead	Glasgow	James Brown.
2	Robert Addie and Sons, Langloan Ironworks, Coatbridge.	Balgray	Maryhill	Robert Allan.
3	James Dunlop and Co., Clyde Ironworks, Tollcross.	Balornock	Bishop Briggs	Thos. Goodwin.
4	William S. Dixon, Govan Ironworks, Glasgow.	Bishop Briggs	Ditto	Thos. Strachan.
5	James Dunlop and Co., Clyde Ironworks, Tollcross.	Bogleshole	Tollcross	John Hart.
6	Carron Iron Co., Falkirk	Cadder	Bishop Briggs	Robt. Clelland.
7	Flemington Coal Co., Cambuslang.	Cambuslang	Cambuslang	David Wingate.
8	James Dunlop and Co., Clyde Ironworks, Tollcross.	Carmyle	Tollcross	John Hart.
9	T. G. Buchanan, Cambuslang	Eastfield	Cambuslang	John Allardice.
10	James Fairrie, Rutherglen	Farme	Rutherglen	James Anderson.
11	Flemington Coal Co., Cambuslang.	Flemington	Cambuslang	David Wingate.
12	Foxley Coal Co., Tollcross	Foxley	Tollcross	John Meikle.
13	Robert Addie and Sons, Langloan Ironworks, Coatbridge.	Gartnavel	Maryhill	Robert Allan.
14	Summerlee Iron Co., Coatbridge	Gilshochill	Ditto	Gavin C. Gordon.
15	William S. Dixon, Govan Ironworks, Glasgow.	Govan	Glasgow	James Gemmel.
16	Strone Coal Co., Glasgow	Hamilton Hill	Ditto	David McCulloch.
17	Summerlee Iron Co., Coatbridge	Kenmure	Bishop Briggs	Gavin C. Gordon.
18	Kirkhill Coal Co., Cambuslang	Kirkhill	Cambuslang	W. Robertson.
19	James Dunlop and Co., Tollcross	Newton	Ditto	Alexr. Robertson.
20	M. Wallace & Co., Bishop Briggs	Over Possil	Bishop Briggs	Walter Galloway.
21	Smith and Shearer, Springburn, Glasgow.	Saracen	Springburn	Robt. Condie.
22	James Smith, Springburn, Glasgow.	Ditto.	Ditto	William Watson.
23	G. Simpson, Cambuslang	Spittalhill	Cambuslang	Robt. McNeil.
24	J. R. Reid, Rutherglen	Stonelaw	Rutherglen	Robt. Muir.
25	GeorgeMcNair and Co., Tollcross	Tollcross	Tollcross	James Stokes.
26	Dunn, Brothers, Cambuslang	Wellshot	Cambuslang	John Anderson.
27	R. Forrester, Cambuslang	Westburn	Ditto	Robt. Morton.
28	Flemington Coal Co., Cambuslang.	Ditto	Ditto	David Wingate.
	Baillieston and Shettleston District.			
1	Springhill Coal Co., Baillieston	Aitkenston	Baillieston	William White.
2	William Baird and Co., Coatbridge.	Bartonshill	Ditto	John Reid.
3	John Reid, Baillieston	Bogside	Ditto	Dundas Simpson.
4	Dunn, Brothers, Baillieston	Braehead	Ditto	John Dunn.
5	Ditto ditto	Bredisholme	Ditto	Ditto.
6	Ditto ditto	Burnt Broom	Mount Vernon	Ditto.
7	Provanhall Coal Co., Baillieston	Calderbank	Baillieston	John Reid.
8	Drumpark Coal Co., Baillieston	Drumpark	Ditto	David Connor.
9	Provanhall Coal Co., Baillieston	Ellismuir	Ditto	John Reid.
10	Gartcraig Coal Co., Shettleston	Gartcraig	Shettleston	Andrew Yeats.
11	R. Brand, Baillieston	Glenduffhill	Baillieston	James Mathie.
12	Springhill Coal Co., Baillieston	Hallhill	Ditto	William White.
13	James Dunlop and Co., Tollcross	Kenmuir	Tollcross	John Hart.
14	John Horne, Tollcross	Kenmuirhill	Ditto	William Anderson.
15	Blair and Stewart, Shettleston	Kennyhill	Shettleston	
16	Alexander Rankine, Shettleston	Lightburn	Ditto	Andrew Henderson.
17	Wm. Baird and Co., Coatbridge	Mainhill	Baillieston	John Reid.
18	John Young, Baillieston	Netherhouse	Ditto	James Muir.
19	Springhill Coal Co., Baillieston	Springhill	Ditto	Wm. White.
20	Ferrier and Strain, Baillieston	Wester Hallhill	Ditto	John Louden.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	LANARKSHIRE COLLIERIES—*continued.*			
	AIRDRIE AND COATBRIDGE DISTRICT.			
1	Wm. Baird and Co., Coatbridge	Cairnhill	Airdrie	Wm. Ramsay.
2	W. S. Dixon, Coatbridge	Calder Ironworks	Coatbridge	Wm. Morris.
3	Drumpeller Coal Co., Coatbridge	Drumpeller	Ditto	George Gray.
4	Summerlee Iron Co., Coatbridge	Ditto	Ditto	Alexr. Faulds.
5	Drumpeller Coal Co., Coatbridge	Dundyvan	Ditto	George Gray.
6	Wm. Baird and Co., Coatbridge	Espieside	Ditto	John Reid, jun.
7	Ditto ditto	Faskine	Airdrie	Wm. Ramsay.
8	Ditto ditto	Gartsherrie	Coatbridge	John Reid, jun.
9	Pettigrew and Co., Coatbridge	Garturk	Ditto	Alexr. Simpson.
10	Wm. Baird and Co., Coatbridge	Gunnie	Ditto	John Reid, jun.
11	Ditto ditto	Hillhead	Ditto	Wm. Ramsay.
12	John Hendrie, Coatbridge	Kirkwood	Ditto	Robt. Colquhoun.
13	Summerlee Iron Co., Coatbridge	Ditto	Ditto	Alexr. Faulds.
14	Wm. Baird and Co., Coatbridge	Lochwood	Ditto	John Reid, jun.
15	Monkland Iron Co., Airdrie	Monkland	Airdrie	John Lindsay.
16	Wm. Baird and Co., Coatbridge	Palacecraig	Ditto	Wm. Ramsay.
17	John Spencer, Coatbridge	Phœnix	Coatbridge	Alexr. Marshall.
18	Wm. Baird and Co., Coatbridge	Raw	Ditto	John Reid, jun.
19	Alexander Cameron, Coatbridge	Ditto	Ditto	Alexr. Cameron.
20	Robert Addie & Sons, Coatbridge	Rosehall	Ditto	John Smith.
21	Pettigrew and Co., Coatbridge	Souterhouse	Ditto	Wm. Black.
22	Summerlee Iron Co., Coatbridge	Summerlee	Ditto	Alexr. Faulds.
	AYRSHIRE COLLIERIES.			
	AYR, DALMELLINGTON, AND GIRVAN DISTRICT.			
1	George Taylor and Co., Ayr	Annbank	Ayr	James Clarke.
2	McHarrie and Couper, Maybole	Barganie	Maybole	John McHarrie.
3	Dalmellington Iron Co., Dalmellington.	Beoch	Dalmellington	David Smith.
4	Ditto ditto	Carbieston	Coylton	David Bryden.
5	Ditto ditto	Chalmerston	Dalmellington	David Smith.
6	Garrochhill Coal Co., Coylton	Corsehill	Coylton	John Nish.
7	Dalmellington Iron Co., Dalmellington.	Craigmark	Dalmellington	David Smith.
8	Ditto ditto	Dalharco	Patna	Wm. Prentice.
9	Hon. T. F. Kennedy, Maybole	Dalquharran	Maybole	David Fulton.
10	James Couper, Maybole	Dalzielsie	Ditto	James Couper.
11	Merry and Cunningham, Coylton	Drongan	Coylton	John Muir.
12	George Taylor and Co., Ayr	Enterkine	Ayr	James Clarke.
13	Ditto ditto	Gadgirth	Ditto	Ditto.
14	Garrochhill Coal Co., Coylton	Garrochhill	Coylton	John Nish.
15	Dalmellington Iron Co., Dalmellington.	Jellieston	Patna	Wm. Prentice.
16	Merry and Cunningham, Coylton	Kerse	Coylton	John Muir.
17	Dalmellington Iron Co., Dalmellington.	Pennyvenie	Dalmellington	David Smith.
18	R. and J. Dunsmuir, Coylton	Schaw	Coylton	
19	Dalmellington Iron Co., Dalmellington.	Sundrum	Ditto	David Bryden.
20	George Taylor and Co., Ayr	Ditto	Ditto	James Clarke.
	IRVINE, KILWINNING, AND DALRY DISTRICT.			
1	Annick Lodge Coal Co., Irvine	Annick Lodge	Irvine	Robt. Watt.
2	Merry and Cunningham, Stevenstone.	Auchinharvie	Stevenstone	John Morton.
3	Mackay and Co., Beith	Barr	Beith	George Sharp.
4	Eglinton Iron Co., Kilwinning	Bartonholm	Kilwinning	James Crookston.
5	Ditto Dalry	Blair Ironworks	Dalry	Archd. Cunningham.
6	Merry and Cunningham, Dalry	Blair	Beith	Geo. Anderson.
7	Ditto ditto	Boghead	Dalry	Wm. Blyth.
8	Finnie and Finlay, Dreghorn	Bourtreehill	Dreghorn	Hugh Findlay.
9	Ditto ditto	Broomlands	Ditto	Ditto.
10	J. Paterson and Co., Irvine	Burgh	Irvine	James Simpson.
11	A. Finnie and Sons, Kilmarnock	Cauldhame	Kilmarnock	John Rorison.
12	R. Dunsmuir, Dalry	Crossroads	Dalry	
13	John Barr, Ardrossan	Doura	Irvine	Robt. Stewart.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	Ayrshire Collieries—*continued.*			
	Irvine, Kilwinning, and Dalry District—*continued.*			
14	A. Kenneth & Sons, Kilwinning	Eglinton	Kilwinning	James Kenneth.
15	Eglinton Iron Co., Kilwinning	Eglinton Ironworks	Ditto	James Crookston.
16	A. Finnie and Sons, Kilmarnock	Fergushill	Ditto	John Glen.
17	Merry & Cunningham, Dalry	Glengarnock	Dalry	James Seggie.
18	J. and P. Oliphant, Dalry	Highfield	Ditto	
19	Merry & Cunningham, Kilbirnie	Kilbirnie	Kilbirnie	Ditto.
20	Ditto Dalry	Middleton	Dalry	Wm. Blyth.
21	Eglinton Iron Co., Kilwinning	Misk	Kilwinning	Jas. Crookston.
22	J. and M. Craig, Kilmarnock	Perceton	Irvine	Hugh Reid.
23	Eglinton Iron Co., Kilwinning	Redburn	Kilwinning	Jas. Crookston.
24	Gilmour, Wood, and Anderson, Irvine.	Shewalton	Irvine	Joseph Gilmour.
25	A. Finnie and Sons, Kilmarnock	Springhill	Kilmarnock	John Rorison.
26	A. Kenneth & Sons, Kilwinning	Springside	Irvine	James Kenneth.
27	Eglinton Iron Co., Kilwinning	Stevenstone	Stevenstone	Jas. Crookston.
28	Merry and Cunningham, Dalry	Swindridgemuir	Beith	Geo. Anderson.
	Kilmarnock and Galston District.			
1	Eaglesham and Dunlop, Kilmarnock.	Ashyard	Galston	Jas. Eaglesham.
2	Eglinton Iron Co., Kilmarnock	Bankhead	Ditto	John Love.
3	John Galloway, Kilmarnock	Barleith	Hurlford	Gilbert McPherson.
4	Bellfield Coal Co., Hurlford	Bellfield	Ditto	Andrew Yeats.
5	John Gilmour and Co., Kilmarnock.	Bonnyton	Kilmarnock	John Nish.
6	Boyd, Gilmour, and Co., Galston	Burn Bank and Ladyton	Galston	Wm. Semple, jr.
7	W. S. Cunningham, Kilmarnock	Caprington	Kilmarnock	John Neil.
8	John Galloway, Kilmarnock	Dollars	Hurlford	Gilbert McPherson.
9	Merry & Cunningham, Dreghorn	Drummuir	Dreghorn	Wm. Walker.
10	J. & A. Eaglesham, Kilmarnock	Dykehead	Hurlford	Alexr. Rigg.
11	A. Finnie and Sons, Kilmarnock	East Thornton	Kilmarnock	Wm. Rodger.
12	John Horne, Galston	Galston	Galston	John Gemmel.
13	Gauchalland Coal Co., Galston	Gauchalland	Ditto	James Hart.
14	Boyd, Gilmour, and Co., Galston	Goatfoot	Ditto	Wm. Semple, sr.
15	R. Yates and Co., Kilmarnock	Grange	Kilmarnock	Robt. Stewart.
16	Eglinton Iron Co., Kilmarnock	Grougar	Ditto	John Love.
17	J. Oastler and Co., Kilmarnock	Hayside	Ditto	Alexr. Lawrie.
18	J. and M. Craig, Kilmarnock	Hillhead	Ditto	Hugh Findlay.
19	John Horne, Galston	Holmes	Galston	John Gemmel.
20	John Howie, Kilmarnock	Hurlford	Hurlford	John Howie.
21	Allan, Gilmour, and Co., Kilmarnock.	Ditto	Ditto	Wm. Hillhouse.
22	A. Finnie and Sons, Kilmarnock	Kilmarnock	Kilmarnock	John Rorison.
23	Eglinton Iron Co., Kilmarnock	Loudoun	Galston	John Love.
24	Maxwood Coal Co., Galston	Maxwood	Ditto	Wm. Rankin.
25	Merry & Cunningham, Dreghorn	Paddocklaw	Dreghorn	Wm. Walker.
26	John McKnight, Kilmarnock	Plann	Kilmarnock	Alexr. Goldie.
27	Allan, Gilmour, and Co., Kilmarnock.	Portland	Hurlford	Daniel Gilmour.
28	Eglinton Iron Co., Kilmarnock	Portland Ironworks	Ditto	John Love.
29	Allan, Gilmour, and Co., Kilmarnock.	Skerrington	Ditto	Wm. Hillhouse.
30	Merry & Cunningham, Dreghorn	Southhook	Dreghorn	Wm. Walker.
31	Ditto ditto	Warrickhill	Ditto	Ditto.
32	Wm. Rankin, Kilmarnock	Woodhill	Kilmarnock	Wm. Rankin.
	Cumnock and Muirkirk District.			
1	Lanemark Coal Co., New Cumnock.	Afton	New Cumnock	John Robertson.
2	J. C. Simpson, Muirkirk	Auldhouseburn	Muirkirk	J. Williamson.
3	William Walker, Auchinleck	Ballochmyle	Auchinleck	Adam Hunter.
4	Bank Coal Co., New Cumnock	Bank	New Cumnock	Kenneth Mackenzie.
5	Eglinton Iron Co., Cumnock	Berryhill	Cumnock	Jas. Smith.
6	Jas. McG. Nicol, Cumnock	Coalburn	Ditto	
7	Eglinton Iron Co., Cumnock	Common	Ditto	Wm. Gray.
8	Ditto ditto	Dykes	Ditto	C. Jamieson.
9	Gilmour, Wood, and Anderson, Auchinleck.	Gilmilnscroft	Auchinleck	Wm. Hastie.
10	Barr and Co., Muirkirk	Glenbuck	Muirkirk	Thos. Pennycuick.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	Ayrshire Collieries—*continued.*			
	Cumnock and Muirkirk District—*continued.*			
11	Eglinton Iron Co., Cumnock	Glengyron	Cumnock	C. Jamieson.
12	Ditto ditto	Glenlogan	Ditto	Wm. Gray.
13	Ditto Muirkirk	Grasshill	Muirkirk	Wm. McCulloch.
14	Ditto Cumnock	Hindsward	Cumnock	C. Jamieson.
15	Ditto Muirkirk	Kaimes	Muirkirk	Wm. McCulloch.
16	Bank Coal Co., New Cumnock	Knockshinnoch	New Cumnock	Kenneth Mackenzie.
17	Eglinton Iron Co., Cumnock	Knockterra	Cumnock	C. Jamieson.
18	Lanemark Coal Co., New Cumnock.	Lanemark	New Cumnock	John Robertson.
19	Eglinton Iron Co., Muirkirk	Lightshaw	Muirkirk	Wm. McCulloch.
20	Ditto Cumnock	Lugar Ironworks	Cumnock	Wm. Gray.
21	Ditto Muirkirk	Maidenbank	Muirkirk	Wm. McCulloch.
22	Archd. Gray & Co., New Cumnock.	Pathhead	New Cumnock	Jas. Gray.
23	Lanemark Coal Co., New Cumnock.	South Boig	Ditto	John Robertson.
24	Eglinton Iron Co., Muirkirk	Stottencleugh	Muirkirk	Wm. McCulloch.
25	Ditto ditto	Wellwood	Ditto	Ditto.
	Western Division of Stirlingshire Collieries.			
1	M. McGregor, Kilsyth	Auchinrivock	Kilsyth	
2	Mr. Muirhead, Campsie	Balglass	Lennoxtown	
3	John Kirk, Campsie	Balgrochan	Ditto	
4	Brown and Rennie, Kilsyth	Balmalloch	Kilsyth	Geo. Barrowman.
5	Wm. Wilson, Banknock, Denny	Banknock	Banknock	John Stirling.
6	J. Johnstone, Bannockburn	Bannockburn	Bannockburn	
7	Carron Co., Falkirk	Bantone	Kilsyth	Alexander Clelland.
8	Wm. Baird and Co., Kilsyth	Barrwood	Ditto	James Cowie.
9	Hurlet and Campsie Alum Co., Campsie.	Campsie	Lennoxtown	Jas. A. King.
10	M. McGregor, Kilsyth	Coney Park	Kilsyth	
11	Cameron and Hutton, Bannockburn.	Cowie	Bannockburn	
12	Robert Addie and Sons, Denny	Dennymill	Denny	Robt. Allan.
13	Moyes, Murray, and Co., Stirling	Dunmore	Stirling	
14	E. Plean Coal Co., Bannockburn	East Plean	Bannockburn	Wm. Wilson.
15	Daniel Wilson, Lennoxtown	Glorrat	Lennoxtown	
16	Wm. Rattray, Bannockburn	Greenyards	Bannockburn	Wm. Rattray.
17	Wm. Baird and Co., Kilsyth	Haugh	Kilsyth	James Cowie.
18	James Wallace & Co., Kilsyth	Neilston	Ditto	John McFarlane.
19	Wm. Baird and Co., Denny	Quarter	Denny	James Cowie.
20	J. Bow and Co., Kilsyth	Queenzie	Kilsyth	John Irvine (interim).
21	Wm. Baird and Co., Kilsyth	Riskend	Ditto	James Cowie.
22	R. Brown, Bannockburn	West Plean	Bannockburn	John Thomson.
	Dumbartonshire Collieries.			
1	James Young & Sons, Milngavie	Baljaffray	Duntocher	J. Young.
2	Merry and Cunningham, Duntocher.	Blairdardie	Ditto	Hugh Johnston.
3	Monkland Iron Co., Airdrie	Cloberhill	Maryhill	Anthony McLuckie.
4	Merry and Cunningham, Duntocher.	Drumchapel	Duntocher	Hugh Johnston.
5	J. M. and N. Robson, Duntocher	Garscadden	Ditto	J. M. Robson.
6	McNair, Stokes, and Dixon, Shettleston.	Garscube	Maryhill	Jas. Stokes.
7	Wm. Baird and Co., Kilsyth	Gartshore	Kilsyth	R. Jamieson.
8	Summerlee Iron Co., Coatbridge	Knightswood	Maryhill	Gavin C. Gordon.
9	Thomas Miller, Cumbernauld	Netherwood	Cumbernauld	
10	Barr and Co., Kirkintilloch	Solesgirth	Kirkintilloch	John McCulloch.
11	J. and A. Wallace, Kirkintilloch	Wester Gartshore	Ditto	J. Muir.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	RENFREWSHIRE COLLIERIES.			
1	Allan Craig and Sons, Paisley	Blackstone	Paisley	A. Craig.
2	W. Black, Paisley	Ditto	Ditto	Robt. Waddel.
3	Clippens Shale Co., Johnstone	Clippens	Johnstone	Wm. Archibald.
4	J. Liddell and Co., Johnstone	Fulton	Ditto	Jas. Maxwell.
5	Merry & Cunningham, Johnstone	Inkerman	Ditto	Wm. Kirkwood.
6	Monkland Iron Co., Airdrie	Jordanhill	Maryhill	Anthony McLuckie.
7	Nitshill Coal Co., Hurlet	Nitshill	Hurlet	John Atkinson.
8	J. Wilson, Pollokshaws	Pollok	Pollockshaws	Robt. Gibb.
9	Lud. Houston, Johnstone	Quarrelton	Johnstone	Hugh Black.
10	Monkland Iron Co., Airdrie	Skaterigg	Maryhill	Anthony McLuckie.
11	J. and T. Shaw, Paisley	Southbar	Paisley	
	ARGYLESHIRE COLLIERY.			
1	J. Smellie and Son, Campbelton	Drumlemble	Campbelton	David Smellie.
	DUMFRIESSHIRE COLLIERIES.			
1	Misses Whygham, Sanquhar	Bankhead	Sanquhar	John Nivison.
2	Ditto ditto	Cairnburn	Ditto	Ditto.
3	Duke of Buccleuch, Canonbie	Canonbie	Canonbie	Alexr. Bowie.
4	Misses Whygham, Sanquhar	Gateside	Sanquhar	John Nivison.
	LANARKSHIRE IRONSTONE MINES.			
1	James Dunlop and Co., Clyde Ironworks, Tollcross.	Balornock and Robroystone.	Bishop Briggs	Thos. Goodwin.
2	W. S. Dixon, Govan Ironworks, Glasgow.	Bishop Briggs	Ditto	Thos. Strachan.
3	Carron Iron Co., Carron Ironworks, Falkirk.	Cadder	Ditto	Robert Clelland.
4	Colin Dunlop and Co., Quarter Iron Works, Hamilton.	Drumoyne	Govan	Alexr. Gairdner.
5	Robert Addie and Sons, Langloan Ironworks, Coatbridge.	Gartnavel and Balgray	Maryhill	Robert Allan.
6	Summerlee Iron Co., Summerlee Ironworks, Coatbridge.	Gilshochill	Ditto	Gavin C. Gordon.
7	W. S. Dixon, Govan Ironworks, Glasgow.	Ibrox	Govan	Jas. Nimmo.
8	Merry and Cunningham, Paisley	Ibroxhill	Ditto	Wm. Kirkwood.
9	Summerlee Iron Co., Coatbridge	Kenmure	Bishop Briggs	Gavin C. Gordon.
10	W. S. Dixon, Glasgow	Mosesfield	Ditto	Thos. Strachan.
11	Wm. Baird & Co., Gartsherrie Ironworks, Coatbridge.	Palacecraig	Airdrie	Wm. Ramsay.
12	Monkland Iron Co., Airdrie	Skaterigg, No. 15 Pit	Maryhill	Anthony McLuckie.
	AYRSHIRE IRONSTONE MINES.			
	Cumnock and Lugar District.			
1	Eglinton Iron Co., Lugar, Cumnock.	Barrhill	Cumnock	C. Jamieson.
2	Ditto ditto	Blackstone	Ditto	Jas. Smith.
3	Ditto ditto	Carbello	Ditto	Wm. Gray.
4	Ditto ditto	Common	Ditto	Ditto.
5	Ditto ditto	Commondyke	Ditto	Jas. Smith.
6	Ditto ditto	Craigstone	Ditto	Ditto.
7	Ditto ditto	Cronberry	Ditto	Wm. Gray.
8	Ditto ditto	Glengyron	Ditto	C. Jamieson.
9	Ditto ditto	Glenlogan	Ditto	Wm. Gray.
10	Ditto ditto	Shankstone	Ditto	C. Jamieson.
11	Ditto ditto	Stepends	Ditto	Ditto.
12	Ditto ditto	Wellwood	Muirkirk	Wm. Gray.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	AYRSHIRE IRONSTONE MINES—*continued.*			
	DALRY AND KILBIRNIE DISTRICT.			
1	Merry and Cunningham, Glengarnock Ironworks, Dalry.	Barkip	Beith	Geo. Anderson.
2	Ditto	Birkentuck	Ditto	Ditto.
3	Eglinton Iron Co., Dalry	Blair	Dalry	Archd. Cunningham.
4	Merry & Cunningham, Dalry	Busbiehead	Kilmarnock	Wm. Walker.
5	W. S. Dixon, Govan Ironworks, Glasgow.	Caldwell	Beith	Jas. Hunter.
6	Eglinton Iron Co., Dalry	Carsehead	Dalry	Archd. Cunningham.
7	Merry & Cunningham, Dalry	Coalheugh Glen	Ditto	Wm. Blyth.
8	Ditto	Fergushill	Kilmarnock	Wm. Walker.
9	Ditto	Glengarnock	Kilbirnie	Jas. Seggie.
10	Ditto	Greenbank	Dalry	Wm. Blyth.
11	Ditto	Highfield	Beith	Geo. Anderson.
12	Eglinton Iron Co., Dalry	Kersland	Dalry	Archd. Cunningham.
13	Merry & Cunningham, Dalry	Kilbirnie	Ditto	Jas. Seggie.
14	Ditto	Muirhouse	Beith	Geo. Anderson.
15	Ditto	Plan	Kilmarnock	Wm. Walker.
16	Ditto	Ryesholm	Dalry	Wm. Blyth.
17	Ditto	Swindridgemuir	Beith	Geo. Anderson.
18	J. Gibson, Dalry	Swinelees	Dalry	
19	Eglinton Iron Co., Dalry	Todhills	Ditto	Archd. Cunningham.
	AYR AND DALMELLINGTON DISTRICT.			
1	Dalmellington Iron Co., Dalmellington.	Bowhill	Dalmellington	Wm. Prentice.
2	Ditto	Burnfoot	Ditto	Ditto.
3	Ditto	Corby Craigs	Ditto	Wm. Arnot.
4	Ditto	Drumgrange, No. 8 Pit	Ditto	Wm. Prentice.
	Ditto	Ditto, No. 9 Pit	Ditto	Wm. Arnot.
5	Merry and Cunningham, Dalry	Kerse	Coylton	John Muir.
6	Dalmellington Iron Co., Dalmellington.	Ponessan	Patna	Wm. Prentice.
7	Merry and Cunningham, Dalry	Rankinston	Coylton	John Muir.
	RENFREWSHIRE IRONSTONE MINES.			
1	Merry and Cunningham, Paisley	Abercorn	Paisley	Wm. Kirkwood.
2	W. S. Dixon, Johnstone	Barbush	Johnstone	Jas. Hunter.
3	W. Black and Sons, Paisley	Blackstone	Paisley	Robt. Waddel.
4	James Dunlop and Co., Clyde Ironworks, Tollcross.	Cardonald	Govan	Geo. Armstrong.
5	Clippens Shale Co., Paisley	Clippens	Paisley	Wm. Archibald.
6	Merry and Cunningham, Paisley	Douglas	Ditto	Wm. Kirkwood.
7	Colin Dunlop and Co., Quarter Ironworks, Hamilton.	Hillington	Govan	Alexr. Gairdner.
8	James Dunlop and Co., Tollcross.	Linnwood	Johnstone	John Gray.
9	Monkland Iron Co., Airdrie	Skaterigg	Maryhill	Anthony McLuckie.
10	Merry and Cunningham, Paisley	Walkinshaw	Paisley	Wm. Kirkwood.
	DUMBARTONSHIRE IRONSTONE MINES.			
1	Merry and Cunningham, Duntocher.	Blairdardie	Duntocher	Hugh Johnston.
2	Monkland Iron Co., Airdrie	Cloberhill	Maryhill	Anthony McLuckie.
3	Merry and Cunningham, Duntocher.	Garscadden	Duntocher	Hugh Johnston.
4	Summerlee Iron Co., Coatbridge	Garscube	Maryhill	Gavin C. Gordon.
5	Merry and Cunningham, Duntocher.	Gartconnel	Duntocher	Hugh Johnston.
6	Wm. Baird and Co., Coatbridge	Gartshore, Nos. 4 & 7 Pits	Kilsyth	Jas. Cowie.
	Ditto	Ditto, Nos. 2 & 9 Pits	Ditto	Robt. Jamieson.
7	Merry and Cunningham, Duntocher.	Hutchison	Duntocher	Hugh Johnston.
8	Summerlee Iron Co., Coatbridge	Knightswood	Maryhill	Gavin C. Gordon.
9	Wm. Baird and Co., Coatbridge	Twechar	Kilsyth	Robt. Jamieson.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	STIRLINGSHIRE IRONSTONE MINES.			
1	Carron Iron Co., Falkirk	Bantone	Kilsyth	Alexr. Clelland.
2	Wm. Baird and Co., Coatbridge	Barrwood	Ditto	Jas. Cowie.
3	Robert Addie and Sons, Langloan, Coatbridge.	Blaefaulds	Denny	Robt. Allan.
4	Robert Addie and Sons, Coatbridge.	Dennymill	Ditto	Ditto.
5	Wm. Baird and Co., Coatbridge	Haugh	Kilsyth	Jas. Cowie.
6	Ditto ditto	Inglestone	Denny	Ditto.
7	Ditto ditto	Quarter	Ditto	Ditto.
8	Ditto ditto	Riskend	Kilsyth	Ditto.
9	Robert Addie and Sons, Coatbridge.	Woodyetts	Denny	Robt. Allan.
	LANARKSHIRE FIRECLAY MINES.			
1	Alexr. Patrick, Glasgow	Blochairn	Glasgow	Jas. Hunter.
2	John Young, Chryston	Cardowan	Chryston	Robt. Young.
3	Garnkirk Co., Chryston, Glasgow	Garnkirk	Ditto	
4	J. Binnie, Gartcosh, Glasgow	Gartcosh	Ditto	
5	Gartcraig Coal Co., Shettleston.	Gartcraig	Shettleston	Andrew Yeats.
6	J. Meikle and Co., Gartveerie, Coatbridge.	Gartveerie	Coatbridge	
7	John Young, Chryston	Heathfield	Chryston	Robert Young.
	AYRSHIRE FIRECLAY MINES.			
1	Finnie and Finlay, Dreghorn	Bourtreehill	Dreghorn	Hugh Findlay.
2	Eglinton Iron Co., Cumnock	Braehead	Lugar	Wm. Gray.
3	Hon. T. F. Kennedy, Maybole	Dalquharran	Maybole	David Fulton.
4	John Barr, Ardrossan	Doura	Irvine	Robt. Stewart.
5	A. Kenneth & Sons, Kilwinning	Eglinton	Kilwinning	Jas. Kenneth.
6	J. and M. Craig, Kilmarnock	Hillhead	Kilmarnock	Hugh Findlay.
7	John Howie, Kilmarnock	Hurlford	Hurlford	John Howie.
8	J. and M. Craig, Kilmarnock	Perceton	Irvine	Hugh Reid.
9	J. McKnight, Kilmarnock	Plann	Kilmarnock	Alexr. Goldie.
	RENFREWSHIRE FIRECLAY MINES.			
1	R. Brown and Son, Ferguslie, Paisley.	Ferguslie	Paisley	J. McDonald.
2	Spiers & Gibb, Caledonia Works, Paisley.	Paisley	Ditto	
	DUMFRIESSHIRE FIRECLAY MINE.			
1	George Clennell, Sanquhar	Sanquhar	Sanquhar	
	LANARKSHIRE SHALE MINE.			
1	Monkland Iron Co., Airdrie	Peep O'Day	Airdrie	John Lindsay.
	AYRSHIRE SHALE MINES.			
1	Annick Lodge Oil Co., Irvine	Annick Lodge	Irvine	Robt. Watt.
2	John Barr and Co., Irvine	Doura	Ditto	Robt. Stewart.
3	A. Finnie and Sons, Kilwinning	Fergushill	Ditto	John Glen.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

No.	Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Name of Manager.
	RENFREWSHIRE SHALE MINES.			
1	Merry & Cunningham, Paisley	Abercorn	Paisley	Wm. Kirkwood.
2	Allan Craig and Sons, Paisley	Blackstone	Johnstone	A. Craig.
3	W. Black and Sons, Paisley	Ditto	Paisley	Robt. Waddel.
4	Clippens Shale Co., Paisley	Clippens	Johnstone	Wm. Archibald.
5	Merry & Cunningham, Paisley	Douglas	Paisley	Wm. Kirkwood.
6	J. Liddell and Co., Johnstone	Fulton	Johnstone	Jas. Maxwell.
7	Clippens Shale Co., Paisley	Middleton	Ditto	Wm. Archibald.
8	Ditto ditto	Milliken	Ditto	Ditto.
9	Merry & Cunningham, Paisley	Walkinshaw	Paisley	Wm. Kirkwood.
	List of Mines classed under the Metalliferous Mines Act.			
	LEAD.			
1	East Blackcraig Mining Co.	East Blackcraig	Newton Stewart.	
2	Islay Mining Co., Islay	Islay	Islay.	
3	Duke of Buccleuch, Wanlockhead.	Wanlockhead	Wanlockhead.	
4	Campbell and Jeffrey, Carsphairn, Dalry.	Woodhead	Carsphairn.	
	IRON ORE.			
1	Eglinton Iron Co., Lugar, Cumnock	Auchinlongford	Muirkirk.	
	LIMESTONE.			
1	Mr. Muirhead, Lennoxtown	Balglass	Lennoxtown.	
2	John Kirk, ditto	Balgrochan	Ditto.	
3	James Young and Sons, Duntocher.	Baljaffray	New Kilpatrick.	
4	Wm. F. H. Arundell, Auldgirth	Barjarg	Closeburn.	
5	Hurlet and Campsie Alum Co., Lennoxtown.	Campsie	Lennoxtown.	
6	Eglinton Iron Co., Kilwinning	Clonbeith	Kilwinning.	
7	Trustees of the late Douglas Baird, Thornhill.	Closeburn	Closeburn.	
8	J. M. and N. Robson, Duntocher	Garscadden	Duntocher.	
9	Daniel Wilson, Lennoxtown	Glorrat	Lennoxtown.	
10	John Johnstone, Stirling	Murrayhall	Stirling.	
11	Lud. Houston, Johnstone	Quarrelton	Johnstone.	
12	J. and T. Shaw, Paisley	Southbar	Paisley.	
	GANNISTER.			
1	Robert R. Horne, Tollcross	Shankraemuir	Chryston.	
	BUILDING STONE.			
1	Alexr. Patrick, Glasgow	Blochairn	Glasgow.	
2	William Stevenson, Cathcart	Orchard	Cathcart.	
3	Francis Brown, Cathcart	Williamwood	Ditto.	

Report of Assistant Inspector.

Sir, Pollokshields, Glasgow, 26th March 1879.

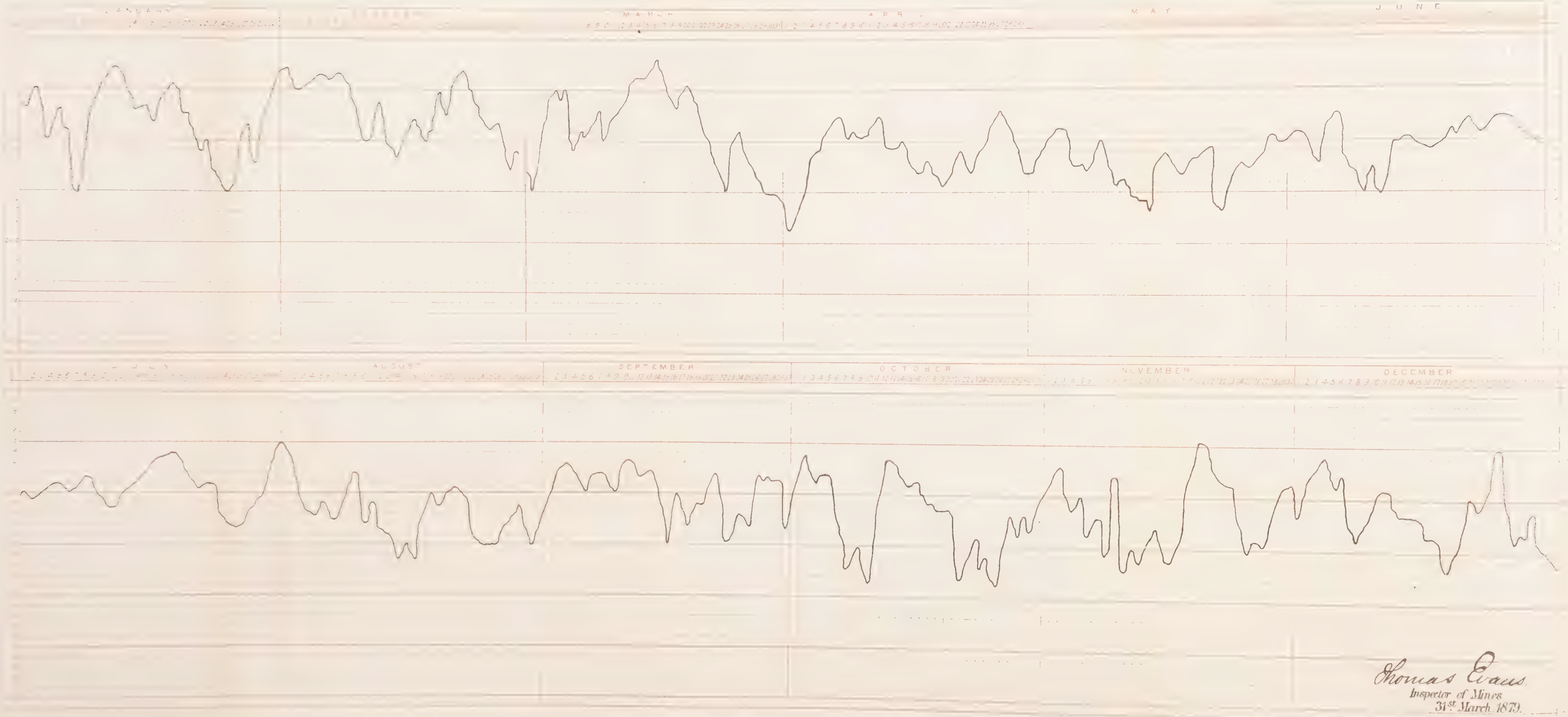
In pursuance of section 48 of the Coal Mines Regulation Act, 1872, and section 20 of the Metalliferous Mines Regulation Act, 1872, I have the honour to report to you that during the past year I have exercised the duties of Inspector in the district of West of Scotland, and that in so doing I have acted as assistant to and under the directions of Mr. Alexander, the Inspector for that district.

I have, &c.,
John M. Ronaldson.

The Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department.

REGISTER OF BAROMETER AT DERBY FOR 1878.

REDUCED TO SEA LEVEL



Thomas Evans.
Inspector of Mines
31st March 1879.

Mr. Evans' Report.

REPORT on the INSPECTION of MINES in the MIDLAND DISTRICT, comprising the counties of Derby, Nottingham, Leicester, and Warwick.—By THOMAS EVANS, Esq., F.G.S.

SIR, Pen-y-Bryn, Derby, 31st March 1879.

I HAVE the honour to lay before you my annual report (for the year 1878) on the inspection of the mines of the Midland district, as required by section 48 of the Coal Mines Regulation Act of 1872.

Forty-nine separate notices of accidents have been received by me during the year, and they have been attended with the loss of fifty-five lives (55).

In the schedule accompanying this, will be found a full detailed account of each separate accident, with but one or two exceptions; these will be fully described in this report.

The depressed state of trade generally throughout the country during the year, has had its effect on the mineral production of the United Kingdom.

The output had gone on rapidly increasing year by year up to 1877, when there was a slight diminution, and a still greater one in this year; the decrease being about three million tons.

Notwithstanding this state of things, there has been an increase in the quantity wrought in the Midland district, amounting to about half a million tons, chiefly in the counties of Derby and Nottingham.

I have pleasure in being able to report that although there is an increase in the production, the loss of life is two less than in the preceding year.

The quantity of minerals raised during the year is about thirteen and a half ($13\frac{1}{2}$) millions of tons; giving employment to 49,354 persons.

In the year 1876 the production was twelve and a half millions of tons; persons employed, 52,448.

This shows there was a million tons more coal worked this year, and 3,094 fewer persons employed.

It will be seen by Table No. 1 that the death-rate of the Midland Counties compares most favourably with the rest of the United Kingdom.

In the United Kingdom 103,257 tons of mineral raised per death.

In the Midland Counties 246,824 tons of mineral raised per death.

TABLE No. 1.

The following table shows a comparison of the number of lives lost per tons of coal raised in Great Britain and the Midland District for the years 1868 to 1878:—

Date.	Tons of Mineral raised.		Deaths.		Tons of Mineral raised per Death.	
	In Great Britain.	In the Midland District.	In Great Britain.	In the Midland District.	In Great Britain.	In the Midland District.
1868 -	104,566,959	7,699,265	1,011	60	103,429	128,321
1869 -	108,003,482	8,100,000	1,116	78	96,777	103,846
1870 -	112,875,525	8,366,000	991	50	113,900	167,320
1871 -	117,439,251	9,252,900	1,075	93	109,246	99,494
1872 -	123,393,853	10,657,100	1,060	79	116,409	134,900
1873 -	128,544,400	11,533,307	1,069	78	129,843	147,837
1874 -	126,214,368	12,232,296	1,056	55	119,521	222,405
1875 -	133,306,485	12,430,600	1,244	65	108,918	191,240
1876 -	148,989,385	12,500,055	933	77	159,688	162,338
1877 -	148,874,244	13,071,566	1,208	58	123,240	225,372
1878 -	145,789,138	13,575,320	1,412	55	103,257	246,824

The quantity of minerals wrought in the year 1876–1878 includes coal, ironstone, and clay.

Inspection of Mines.

In the five years immediately following the passing of the Coal Mines Act of 1855, the death-rate was one life lost per 101,459 tons of coal. In the past five years ending 31st December 1878, one life lost per 209,064 tons.

Death-rate 1856 to 1860 inclusive - - - 1 life per 101,459 tons of coal.

Death-rate 1874 to 1878 inclusive - - - 1 life per 209,064 tons of coal.

If the mortality had gone on in the same ratio the last five years as it had done in the first period, the coal raised per life would have been about 50,000 instead of 209,064, as at present.

These statistics are very satisfactory. I do not for one moment pretend to say that these splendid results are altogether due to inspection, but I am clearly of opinion that it has worked well and done good service. An inspector constantly going from colliery to colliery gains enormous experience, and is often able to offer suggestions which tend to the safety of the workpeople; and having the confidence of the responsible agents, managers, and others (he is very little use without it), he is consulted, and ever ready to give the best advice in his power.

I am afraid many of the public are expecting too much from inspection. Loss of life from accidents in and about mines can no doubt be lessened, but no amount of inspection, legislation, or good management and steadiness on the part of the men will altogether prevent accidents in coal mines. The very nature of the occupation is one of danger, and many unforeseen catastrophes take place which are beyond the control of man.

I have always tried to the best of my judgment to carry out the spirit and intention of the Act of Parliament, and to do this fairly the position is often a delicate one.

The duties of an Inspector of Mines are varied. There is an enormous correspondence to attend to daily. I have this year written and received many thousand letters. Plans of abandoned mines have to be examined; inquests to attend; meetings with owners, agents, and managers on matters of detail connected with their mines; meetings in London; petty sessions; instructing and getting together evidence in prosecutions under the Mines Act; complaints to be investigated; inspections of coal and metalliferous mines.

The travelling necessary for the proper discharge of the duties of his office is of itself laborious. This year my assistant and myself have travelled about twenty-nine thousand three hundred miles.

With the exception of a fortnight's holiday, the whole of my time has been devoted to the public service.

My assistant, Mr. Stokes, gives the following analysis of the work done by himself this year:—

"I have made 160 underground inspections; attended 33 inquests, and 28 attendances at solicitors' offices, magistrates' sessions, and other appointments.

"I have also made 146 visits of inspection to inquire into and see the condition of the machinery, report books, plans, fencing, &c.; also to inquire into the provisions of the Act relating to the employment of young persons, workmen's complaints, &c.

"The distance travelled by myself alone during the year was more than fifteen thousand miles (15,019), and I had three days' holiday during the year.

"The statistics of the district, which are both voluminous and important, have all been abstracted and tabulated at night, requiring many hours of hard and laborious work, the January and February Returns—more than one thousand in number—having all to be carefully abstracted before the statistics of the district could be made out."

The following are the Tables and Summaries generally given in my report:—

TABLE No. 2.

TABLE showing the Number of Deaths, the Coal raised, and the Number of Tons of Coal raised for each Death, during the 23 years ended 31st December 1878.

Dates.	Explosions of Gas.	Falls of Roof.	In Shafts.	Crushed by Tubs, and Miscellaneous Accidents.	Inundation of Water.	Boilers burst-ing.	Total.	Tons of Coal raised.	Tons of Coal raised for each Death.
1856	3	21	16	6	—	—	46	4,500,000	97,000
1857	15	14	6	20	—	—	55	4,750,000	86,000
1858	—	16	16	10	—	—	42	5,060,000	121,000
1859	2	18	13	7	—	—	40	5,460,000	136,500
1860	3	21	13	13	—	—	50	6,215,000	124,000
1861	3	21	15	7	23	—	69	6,503,319	94,000
1862	2	25	4	12	—	—	43	6,647,000	154,000
1863	4	26	9	8	5	—	52	7,000,000	134,000
1864	11	30	9	16	—	—	66	7,300,000	110,000
1865	9	36	13	24	—	—	82	7,575,000	92,383
1866	7	26	6	19	—	—	58	7,600,000	131,034
1867	4	25	11	24	—	—	64	7,600,000	118,750
1868	1	24	9	26	—	—	60	7,699,000	128,317
1869	6	31	12	21	4	4	78	8,100,000	103,846
1870	2	22	6	19	—	1	50	8,366,000	167,320
1871	42	31	5	15	—	—	93	9,252,900	99,494
1872	7	38	8	26	—	—	79	10,657,100	134,900
1873	4	39	10	25	—	—	78	11,533,307	147,837
1874	3	23	6	23	—	—	55	12,232,296	222,405
1875	1	26	17	21	—	—	65	12,430,600	191,240
1876	6	46	8	17	—	—	77	12,331,546	160,150
1877	1	30	6	21	—	—	58	12,903,886	222,481
1878	—	31	11	13	—	—	55	13,440,184	244,367

Prosecutions.

The following persons, being owners, agents, or managers of coal mines, have been convicted for offences against the Mines Regulation Act of 1872:—

Thomson, Dr., Glasgow agent to the Ibstock Coal Company, Limited, Leicestershire.

Small, George, one of the owners of Kilburne Colliery, and the certificated manager.

Checkland, George, one of the owners of the Donisthorpe Colliery.

Millership, Thomas, agent to the Messrs. Checkland and Company.

In obedience to your commands, a public inquiry was held at the Guildhall, Derby, by Henry Cadogan Rothery, Esq., Wreck Commissioner, of Somerset House, into the conduct of Thomas Millership, to ascertain whether he is a fit and proper person to continue to hold a manager's certificate. After a patient hearing the learned Commissioner cancelled his certificate.

The "case" and decision are given at length. Mr. Leech, solicitor, Derby, conducted the case for the Home Office in the most able manner; and Mr. Stanger, instructed by Mr. Dewes, solicitor, Ashby-de-la-Zouch, appeared for the defendant.

"The Coal Mines Regulation Act, 1872."

"In the matter of an inquiry into the conduct of Thomas Millership, now or late of Donisthorpe, in the county of Derby, colliery agent or manager, a person holding a certificate as manager of a mine under the above-named Act.

Before Henry Cadogan Rothery, Esq., Wreck Commissioner, of Somerset House, in the county of Middlesex. F. N. Wardell, Esq., acting as assessor.

Statement of case upon which the inquiry is instituted.

The inquiry is instituted under the 32nd section of the Coal Mines Regulation Act, 1872, upon or under the following circumstances, namely:—

1. That you, the said Thomas Millership, are a person holding a certificate of service as manager under the above-named Act, and acting under or by virtue of such certificate you had in the month of October 1876 the daily supervision of the Ellistown Colliery, situate at Ellistown, in the county of Leicester, the owner of the said colliery being Mr. Joseph Joel Ellis.

2. That on the 4th day of the said month of October 1876, you, the said Thomas Millership as such manager of the Ellistown Colliery as aforesaid, did not cause an adequate amount of ventilation to be constantly produced in the mine of the said colliery, to dilute and render harmless noxious gases to such an extent that the working-places of the shafts, levels, stables, and workings of such mine, and the travelling roads to and from such working-places, should be in a fit state for working and passing therein, contrary to the 1st general rule set forth in the 51st section of the said Act; and you were convicted of such offence by the justices assembled at the petty sessions at Hinckley, in the county of Leicester, on the 16th day of December 1876, and you were fined in a penalty of 5*l.* and costs.

3. That on the said 4th day of October 1876 an explosion of gas took place in the said mine of the Ellistown Colliery of which you were such manager as aforesaid, whereby personal injuries were inflicted to a person or persons employed in or about the said mine; and you, the said Thomas Millership, did not within 24 hours next after the said explosion or accident send notice in writing of the explosion or accident, and of the personal injury occasioned thereby, to the Inspector of the district, on behalf of the Secretary of State, contrary to the 39th section of the said Act, and you pleaded guilty to and were convicted of such offence by the said justices assembled at the petty sessions at Hinckley aforesaid on the said 16th day of December 1876, and you were fined in a penalty of 5*l.* and costs.

4. That on the 27th day of June 1877, you, the said Thomas Millership, as such manager of the Ellistown Colliery as aforesaid, did not cause an adequate amount of ventilation to be constantly produced in the mine of the said colliery, to dilute and render harmless noxious gases to such an extent that the working-places, shafts, levels, stables, and workings of such mine, and the travelling roads to and from such working-places, should be in a fit state for working and passing therein, contrary to the 1st general rule set forth in the 51st section of the said Act, and you were convicted for such offence by the justices assembled at the petty sessions at Hinckley aforesaid on the 27th day of September 1877, and you were fined in the full penalty of 20*l.* and costs.

5. That on the 18th day of June 1878, you, the said Thomas Millership, as the agent of the Donisthorpe Colliery, situate at Donisthorpe, in the county of Derby (of which George Edward Checkland and others were the owners), did not cause an adequate amount of ventilation to be constantly produced in the mine of the said colliery to dilute and render harmless noxious gases to such an extent that the working-places, shafts, levels, stables, and workings of such mine, and the travelling roads to and from such working-places, should be in a fit state for working and passing therein, contrary to the 1st general rule set forth in the 51st section of the said Act, and you were convicted of such offence by the justices assembled at the petty sessions at Swadlincote, in the county of Derby, on the 6th day of August 1878, and you were fined in a penalty of 10*l.* and costs.

6. That on the said 18th day of June 1878, you, the said Thomas Millership, as such agent of the Donisthorpe Colliery as aforesaid, did not in the underground plane of the said mine on which persons travel, which was self-acting or worked by an engine windlass or gin exceeding thirty yards in length, provide some proper means of signalling between the stopping places and the ends of the plane, contrary to the 10th general rule set forth in the 51st section of the said Act; and you were convicted of such offence by the said justices so assembled at the petty sessions at Swadlincote aforesaid on the said 6th day of August 1878, and you were fined in a penalty of 5*l.* and costs.

Dated the 14th day of November 1878.

Mr. Leech, in his opening remarks, said that Mr. Millership held a certificate of service as a colliery manager. In consequence of an explosion which occurred in the mine of which he was manager on the 4th of October 1876, Mr. Evans, the Inspector of Mines, felt it his duty to report the case to the Secretary of State, who had caused the present inquiry to be made, with a view to ascertain if Millership had so far neglected to perform his duty as to have his certificate taken from him. The first witnesses called, proved that the defendant had been convicted at different times before the magistrates at Hinckley and Swadincote for the offences which were to be gone into before the Commissioner.

The next witness was Joseph Holmes, a collier, who worked at the Ellistown colliery, at which Millership was manager. At nine o'clock on the night of the 4th October 1876 he was driving a heading. He had a candle by his side. All at once he felt a peculiar sensation, and some gas exploded a few yards from where he was at work. It burnt him on the back and face. He was under medical treatment five weeks. He was not warned that there was any gas in the pit. He never worked with a safety lamp, though there were some in the pit. He never saw the manager in the pit. The deputy had been there a short time before the explosion.

Mr. Arthur Henry Stokes, assistant inspector of mines for the Midland district, said he visited the Ellistown Colliery on the 18th of October 1876, and saw Mr. Millership there. By witnesses's

request he produced the report books of the mine. Up to that time Mr. Evans had not had any official notice of the explosion which happened a fortnight before. The report books (produced) were signed by the deputies. A number of reports stated that there was gas from the 17th September to the 14th October in various places in the mine. On the 4th of October there was a report as follows:—"Gas exploded in north counter-stall opening at 9 p.m., and a man slightly burnt. Gas in north level head. All else right and safe." These were signed by a man named Cummins, a deputy. The report showed that gas existed in both north and south levels. Witness called Mr. Millership's attention to the fact that a man had been burnt, and he answered that it was only very slightly. Witness said such a thing should have been reported, and he should forward a report to the Chief Inspector, Mr. Evans. Witness took an extract from a book at the time, which book could not since be found. The extract was as follows:—"October 6th, coal pit filled with gas on the north stall." Signed by T. Bridget, underviewer. Witness said the mine must be in a dreadful state, judging from those reports. It was a new colliery, and only one of the shafts was at the time completed. The pipe conveying air to the mine did not extend to the point where the men were at work. Witness told him he should not have been driving the headings, considering the state in which the ventilation was, and that he ought not to have allowed a naked light down the pit. There was plenty of ventilation when witness was down the pit on the 18th, but in some cases it was not properly directed. Defendant seemed to treat the explosion as a very slight affair. He also took a report from the underviewer's book. It was as follows:—"September 24th.—Deputy Cummins says that he found a great quantity in north counter-head. Air-pipes made up with water."

Martin Cummins, deputy at the colliery in question, spoke to having made an entry in the report book on the 4th of October 1876 of an explosion. He had made several reports previous to that date, of the presence of gas in the mine.

Mr. Thomas Evans, chief inspector of mines for the Midland district, said he never received any notice from Mr. Millership of the explosion in the Ellistown Colliery which took place on the 4th October 1876, till after he had called Mr. Millership's attention to it, having heard of the occurrence in an indirect manner. He sent the following letter to the defendant, bearing date October 19th, 1876:—"Dear Sir,—I understand an explosion of gas took place in the Ellistown Colliery on the 4th instant; it has never been reported to me. Gas has been reported 38 times in the colliery, and it is in a dangerous state. I shall report this to the Secretary of State, and no doubt legal proceedings will be taken against the owner or manager.—I am, yours truly, Thomas Evans." There was a charge against Millership also for negligence of duty in June 1877.

Another charge was preferred against the defendant of not providing sufficient ventilation in the pit. Mr Arthur Henry Stokes said he visited the colliery on the 27th of June, 1877. He produced his report containing the original report taken at the time. Mr. Millership was not there. He went round the pit with the underviewer, Mason, who was the next official under Millership. They came to stall No. 9, where they found explosive gas existing within a few yards of the working face. It existed for some distance along the roof, and fired in his lamp in three places. In the middle of this distance there was a brattice-cloth erected, which extended across the whole width of the roadway, leaving a small opening over the top. This was erected for the purpose of clearing the place of gas, but the ventilation was so inadequate that it would not remove it. He spoke to the underviewer concerning the matter, and asked him what motive power he had to create ventilation in the mine. He then went to the bottom of the shaft, and found that there was no motive power at all. There was a furnace at the downcast shaft, with all appliances ready to be lighted, but it was not lighted. If it had been lighted the shaft would have been converted into an upcast shaft, and a good ventilation would have been caused. He spoke to Mason about it, and he said he could not light it without the orders of the manager. If a candle had come in contact with the gas in No. 9 stall an explosion would have been inevitable. Men were at work with naked lights in the stall near, and men were passing the cloth frequently in the dark. If there had been a fall of roof near, it is probable that the gas would have been driven into the stall where naked lights were being used, and would have exploded. He found in the books that gas had been reported in the stall No. 9 for thirteen times from the 15th June to the 27th of the same month.—By Mr. Rothery: The roadway was the means of carrying air to the stall. If the furnace had been lighted there would have been a good ventilation, as it was a small mine. All the ventilation of the mine was supplied naturally by the two shafts. The current of air went up one and down the other. In answer to a question by the Commissioner, the witness said that it was a matter of chance which shaft was the upcast and which the downcast. The air coming up the upcast would be rarefied and warmer than the outside, owing to its having passed through the mine. If the furnace had been lighted, the ventilation would have been reversed. If it had been desired, the ventilation could have been reversed by throwing a quantity of water down the upcast shaft.

There was another charge against Mr. Millership.

Mr. Stokes was again examined. He visited the Donisthorpe Colliery on the 18th June 1878. The defendant there acted as agent, and the manager was a Mr. Walton. They both held Government certificates as managers of mines. Witness went to the colliery, as Mr. Evans had received a workman's complaint. He saw the defendant at the top of the pit with the manager, and said he had received a complaint of the dangerous state of the mine, and wished to go down and make investigations. Mr. Walton went down the pit with witness. They proceeded along the bottom. He found that in some places there was no ventilation, but found a quantity of carbonic acid gas, which would require a stronger current of air to dissipate it than explosive gas. Carbonic acid gas was very injurious to work in. Two per cent. in the air would injure, four per cent., would kill in time, and a candle would not burn in eight per cent. He called the attention of Mr. Walton to the deficiency in the number of doors. On his return to the bank witness told the defendant that the workmen's

complaint as to the fault in the air was correct. He denied that he was responsible. There was no reason why the pit should not have been thoroughly ventilated, and it might have been if the appliances which were at hand had been properly used.

Mr. Henry Mills, of the firm of Coke and Mills, mining and civil engineers, Chesterfield, said he was agent for Sir Myles Cave, the owner of the Donisthorpe Colliery. He visited it frequently during the time that the defendant was there, who acted as the head manager. Witness then read letters he had received from Mr. Millership, which pointed to the conclusion that he had the management of the works.

Mr. George Edward Checkland, one of the proprietors of the Donisthorpe Colliery, said the defendant was in his employ about twelve months. He left soon after he was before the Swadlincote magistrates, which was in September last.

The next charge against the defendant was for neglect to supply proper signals on the engine plain at the Donisthorpe Colliery. Mr. Stokes, again examined, said that when at the colliery on the 18th June 1878, he saw that the signal apparatus was defective, as there were 60 yards with no means of signalling. He requested to be shown how the signalling was done, and he found the man in charge connected the tubes and after walking some distance along the roadway shouted to a boy, who signalled to the engine-man. The system was very dangerous.

That was the case for the Home Office.

Mr. Stanger said he was not instructed to oppose the cancelling of Mr. Millership's certificate, for which Mr. Leech had asked. He was not prepared to dispute what had been alleged against him, though at the same time he (Mr. Stanger) was not prepared to admit that all which had been stated by the witnesses was true. He had no witnesses to call nor any materials before him to disprove the charges which had been brought against defendant. Mr. Millership had, after great anxiety of mind, and after consultation with his friends, decided that he would not go to the expense of bringing witnesses to contest the case. He had, however, an application to make with reference to the costs of the inquiry, and it was that the defendant should not be saddled with them. If it had been possible for Mr. Millership to have, as it were, pleaded guilty to the charges preferred against him, and have given up his certificate, he would have done so. He made a request to the Secretary of State that he should be allowed to hand him over the certificate he held, but the Secretary of State said he could not receive it, and that an inquiry must be held. He submitted now that it would be great hardship to the defendant if, in addition to having his certificate cancelled, he was also saddled with the costs of the inquiry. He could not avoid the inquiry, though he would willingly have done so. He had been already fined before the magistrates for the offence he had committed; in one case he was mulcted in the penalty of 20*l.*, and it would be manifestly unfair if he were called on again to pay more costs.

Mr. Leech said he felt bound to oppose the application of Mr. Stanger. If the defendant had committed certain offences, it was only right that he should pay the penalty as according to the law of the land. The inquiry was held not merely to punish the defendant, but to hold up such conduct as he had been guilty of to public view. It was not merely Mr. Millership who was involved in the case, but the whole mining community of the country were more or less interested. The Act under which the case was brought was passed for the purpose of protecting the life and limbs of the men engaged in getting coal, and if a case like that now before the Court were passed over lightly it would be said that the Act of Parliament was a mere farce. He should suffer the consequences of his conduct. It was his conduct which had brought about the inquiry, and that being so, the whole constitution of the law of the land said that he should be the loser. The person who did wrong should bear the brunt of the battle.

The Court then adjourned, after which the Commissioner proceeded to give judgment. He said that the present inquiry was instituted under the 32nd section of the Coal Mines Regulation Act, 1872, to ascertain whether the certificate of Mr. Thomas Millership, late colliery manager, should be cancelled. After reviewing the evidence of the witnesses connected with the Ellistown Colliery, the Commissioner stated that the defendant had violated two important provisions of the Act at Ellistown. First of all he had violated the 51st section of the Act, which provided for proper ventilation, and also the 39th section, in that he did not, within 24 hours of an explosion, give notice of the same to the Inspector of Mines. For those two offences he was fined 10*l.* before the Hinckley magistrates, and for a like offence in the following June he was fined 20*l.* The Commissioner then proceeded to deal with the evidence which referred to the Donisthorpe Colliery, and said that on the 6th August last the defendant was fined at Swadlincote 15*l.* for the offences committed at that colliery. The evidence showed the defendant had been guilty of great incompetency or gross negligence in every instance which was brought before the Court, and he could do nothing but decide to cancel the certificate. The only question which remained for him was that of costs. He then proceeded to state in detail the arguments urged by Mr. Leech and Mr. Stanger for and against charging the costs on the defendant. He (the Commissioner) thought that, seeing in the public interest it was the duty of the Secretary of State to institute the inquiry, and considering everything connected with the case, it would be a very harsh thing if the defendant was condemned in the costs. The defendant had in no way done anything to increase the costs, and therefore he would not be charged with them.

The proceedings then terminated.

The disqualification of certain magistrates from adjudicating in mining cases in this district causes great inconvenience and delay.

Mr. Markham, managing director of the Staveley Coal and Iron Company, and an active magistrate in the Chesterfield division, writes me thus:—

"On Saturday last, the 7th of December, there were some mining cases brought before the Chesterfield Bench, when Mr. Barnes, Mr. Carrington, Mr. Bertie Barrow, and myself retired from the bench. In looking into the Act of Parliament which prohibits certain magistrates from adjudicating on offences against the Mining Act, it struck me it might be doubtful what was the real interpretation of the clause, as it certainly appeared to me nonsense that because young Mr. Barrow's father held shares in a limited company, that his son was disqualified in acting in such cases. The real question appears to be what is the definition of the word *owner*; and I have come to the conclusion that as an owner of shares in a limited company could *not be sued*, but could be prosecuted for removing property belonging to a limited company in which he held shares, he could not in law be considered an owner, and the question really is whether the Act does not contemplate that a person shall not sit in mining cases in which they are not personally interested."

This letter was handed over to counsel, and the following is the opinion of Mr. H. B. Poland, Q.C.

"I am of opinion that a shareholder in a limited company is not an owner within sections 67 and 72 of 'The Coal Mines Regulation Act, 1872' (35 and 36 Vict. c. 76). Section 67 enacts that 'a person who is the owner, agent, or manager of any mine to which 'this Act applies, or the father, son, or brother of such owner, agent, or manager, shall 'not act as a court or member of a court of summary jurisdiction in respect of any 'offence under this Act.' And section 72 says that the term 'owner,' 'when used in 'relation to any mine, means any person or body corporate who is the immediate proprietor 'or lessee or occupier of any mine, or of any part thereof, &c.' It cannot, I think, be said that a shareholder is a person who is 'owner' of any mine, or of any part thereof. A limited company formed under the Companies Act, 1862, (25 and 26 Vict. c. 89,) is a corporation (see section 18), and the owner of the mine is the company, and the company as owner would be liable to the various penalties under 'The Coal Mines Regulation Act, 1872,' and liable to be rated as the occupier."

As pointed out by Mr. Markham in his letter, a shareholder could be indicted for stealing the property of the company; and it would be indeed absurd if a magistrate, who happened to be the father, son, or brother of a man who held a share in a company owning a mine, was disqualified to act as a justice in all cases under that Act.

No magistrate who is a shareholder of a company owning a mine can act in cases relating to that particular mine, as he would then be interested in the matter upon which he would have to adjudicate. The common law rule would apply, viz.:—that it is a fundamental rule in the administration of justice, that a person cannot be judge in a case wherein he is interested, *nemo sibi esse judex vel suis jus dicere debet.* See the cases below establishing this proposition*.

(Signed) HARRY BODKIN POLAND,
5, Paper Buildings, Temple.

Dec. 24th, 1878.

Explosions of Gas.

It is most gratifying to me to be placed in the enviable position in being able to report to you, that during the whole of this year there has not been a single fatal accident, not one life lost from an explosion of gas.

It is worth recording the fact that over 20 million tons of coal, have been raised since the last fatal explosion; and during the last two years about 26,700,000 tons of coal were produced for one life lost.

The question may be asked, how are these results obtained? In my opinion it is in a great measure due to the system employed in working the coal, for the most part the "long wall" is the recognized plan; care is taken to fill with débris all places from which the coal has been extracted, so as to make it impossible to have at any time a large accumulation of gas. The ventilation is constantly kept up to the face of the workings, carrying with it any noxious gas emitted from the waste; the supply of air must be abundant, sufficient for almost any extraordinary occurrence which might probably arise. Improved discipline, the employment of a better educated class of men to manage, and lay out the mines, and a better class of officials generally has also had its good effect.

* R. *v.* Hertfordshire, 6 Q. B., 753. R. *v.* Cheltenham, 1 Q. B., 467. Dimes *v.* Grand Junction Canal Co., 3 H. L., 759. R. *v.* Allen and others, 33 L.J.M.O., 98. R. *v.* Hammond and another, 12 W.R. 208. Paley on Conviction, 5 Edw. 38 & 39, *et seq.*

The seams of coal vary in thickness from 2 feet to 14 feet, some of them giving off large quantities of gas, and, when necessary, worked with locked safety-lamps.

Falls of Roof and Sides.

Thirty-one lives lost from falls of roof and sides of workings. This is one more than the year immediately preceding this; but on comparison with the five years following the passing of the Act of 1855 (the earliest accurate statistics of the death-rate in mines), it will show a favourable result. The death-rate for the five years was one for 286,648 tons of coal raised; this year it is one per 437,913.

If the deaths per tons of coal had continued in the same proportion as in the five years referred to, instead of being 30 it would have been 90.

But notwithstanding all this, it cannot be denied that however much has been done, there yet remains room for improvement. On the part of the owners, the appointment of men competent, and who will insist on strict discipline; a constant and regular supply of timber and materials at or near the working places. On the part of the men, watchfulness; a constant examination of the roof, and a proper (not wasteful) use of timber. I have often written and pointed out that this, the great source of danger to the miner, in many cases results from carelessness which can be brought home to the injured man. I do not say wilful neglect, but thoughtlessness; probably the constant exposure to danger and the habit of frequently running risks prevents their realizing the danger they incur.

Two men advanced in life, of great experience, were killed by the falling of the roof on to them. It was found on inspection, the packs or supports to the roof had not been kept sufficiently forward.

On the 29th of January one poor fellow was killed in a well-timbered stall. The roof fell between the props and the face.

On the 27th day of August a man was killed whilst in the act of knocking out a "sprag." He was an experienced collier and accustomed to do such work. It is an operation requiring both skill and judgment.

One man was killed whilst taking out a sprag before firing a shot.

On the 31st of October two men were killed; one a stallman, 30 years of age, the other a loader. Here it was found that the stallman had neglected or forgotten to set the timber as he took away the coals.

It will be seen that some of the accidents are preventable, whilst others are beyond the control of the workmen, and are consequent, and always will be, on the nature of the occupation of a coal-miner.

On the 15th of March a large piece of coal burst off the face whilst deceased was, as he thought, perfectly safe.

April 18th; a man 45 years of age was killed by the falling of a quantity of bind between the timbers.

On the 3rd of July a collier, aged 35 years, met with his death from a fall of roof, and here there was an insufficient supply of timber to properly secure the roof.

Shafts.

Eleven deaths in shafts, as against six last year.

On the 11th of March two men were killed whilst engaged in removing air-pipes in a shaft at Holbrook, belonging to Messrs. J. and G. Wells.

In some way the pipes suddenly gave way, released from their fastenings, and fell down upon one poor fellow, killing him on the spot, and the other died from the results of injuries received, a few days after the accident happened.

On the 30th March a workman at Hawkesbury ascended the shaft, and, mistaking the landing, stepped out and fell to the bottom.

On 29th June, at Dale Colliery, a man was about to descend a pumping shaft at this mine for the purpose of making some examination of the pumps. He tied the non-seat (commonly called a "horse") on to the winding rope, but almost the instant the weight of his body came on to the horse, the knot which attached the horse to the rope gave way, and he fell to the bottom, a distance of about 40 yards.

On the 19th November a man at Digby Colliery accidently pushed a tub into the shaft under the fencing, and it is supposed he lost presence of mind, and fell with the tub. The fence ordinarily was a sufficient one, but on this occasion part of it had been removed temporarily to send down coal to the ventilating furnace. There was just room for the tub to pass under the single bar, and he must therefore have been stooping very low, otherwise he could not have passed under the bar. It was only about three feet in height.

On the 26th of December a man was killed at the Langton Colliery. It appeared from the evidence given before the coroner, Mr. Busby, it was the duty of deceased each morning before ascending the shaft, to cover the sump and make it safe before the men went down. On this occasion he proceeded to the sump, and at the same time gave the signal to the engineman to lower the cage, thinking there was time enough to get clear from the sump before the cage could reach the bottom of the shaft. This however was not so, for it was lowered on to the poor fellow. He was so seriously injured that he died after a few weeks dreadful suffering. He told his friends over and over there was no one to blame but himself.

No. 25 in the list. Four men were killed in a shaft at Hollingwood Colliery, Staveley. The evidence given before Mr. Coroner Busby will best describe the accident.

Joseph Humble, of Barrow Hill, Staveley, colliery manager to the Staveley Company.—

I am manager of all the coal mines and pits, including the Hollingwood New Pumping Shaft, where the accident occurred. I have a plan of the pit bottom showing the portion in which the pipes were before the accident (describing the plan). The main bunting at the bottom to support the pipes is two feet six inches deep and 18 inches wide. The pipes are six inches diameter inside. There were two sets of pipes in the shaft, one for steam, one for water. We fixed them from the bottom upwards. There were 215 yards of steam-pipes and 160 of water-pipes in the shaft at the time of the accident. There was only one more steam-pipe to put in at the top to connect it with the steam-pipes from the boilers. They were supported with a bunting every fourth pipe, *i.e.*, every 12 yards, by a bunting and a strap of cast-iron (2½ inches by ½ inch at least). The buntings were of pitch-pine 9 or 10 inches square. The straps were bolted to the buntings. The pipes supported themselves. There were no other means of supporting the steam-pipes in the shafts except by their own weight. There was no bracket on the line of steam-pipes. Some days before Friday, the 19th July, the steam-pipe was commenced to be put in from the bottom. When they got to the first bunting the enginewright, or some of the men working, told me that the first bunting was at the sixth pipe from the bottom. On account of this I told them we would put in an extra bunting just above the arch at the pit bottom. The brickwork was taken out at that point to admit of the bunting end being put in. John Elliott, the enginewright, who was in charge with the fixing of those pipes, put the bunting in this shaft on Tuesday or Wednesday night the 16th or 17th July. There were two copper-wire lines hanging down from the pit top. The buntings were to be placed in 13 inches from the lines of the wires. The pipes having been up, Elliott tells me he thought they were all straight, and he put the bunting up to the pipes instead of gauging by the wire lines (the bunting holes were already in the shaft). On Wednesday or Thursday morning (July 17th or 18th), Thomas Shore when he reached the bunting (tells me) that he found one end of the bunting two inches nearer the copper line than it ought to have been. The bunting was then bricked into the shaft, and I therefore told him not to touch the bunting, as I considered the pipes and bunting secure, notwithstanding its being two inches out of plumb. I told Shore (his men being present) that if they had time they might cut two inches out of the bunting and tighten the bolts so as to bring them in a perpendicular line to the bunting. They continued putting the pipes in until Friday afternoon 19th July. They were waiting for pipes between five and six p.m., so they commenced to tighten the joints by screwing the bolts at each joint. When they got to the extra bunting (above the arch) I am told that they commenced to alter the bunting. They cut the brickwork out at each end of the bunting for the purpose of loosening it, and so pushing it backwards inside the shaft, contrary to order. When the bunting was got out the Monday after the accident we found the strap off it and the two bolts remaining in the timber without the nuts. From that I concluded that as soon as the men had taken the strap off, the pipes being out of the true line between the bottom and the fifth pipe, the weight of the pipes would cause the bend to increase towards the shaft side. This liberated the steam-pipes which broke off at the third joint, and so liberated the straps and pipes above, and all the steam-pipes from the top to the bottom fell down, cutting away the extra bunting and several buntings above it, and caused the scaffold, on which the men were, to fall down to the bottom with them. The buntings having been broken as above, liberated the water pipes which fell down immediately after the steam-pipes, 215 yards of steam-pipes and 145 yards of water-pipe fell, leaving 154 more of water-pipe standing in the shaft. The expansion of the steam-pipes from top to bottom is about 12 inches, and that expansion prevents it from fixing the steam-pipes tight with lateral support. There are collarings put to prevent them oscillating. It would be more secure to put in double buntings, but I have never seen it done. There are not any marks on the extra bunting of the men having commenced cutting as I ordered them. The men's shift commenced at 6 p.m., and the accident happened at 7.30 p.m.

The depth of the shaft from top to bottom of sump was 242 yards. There were 24 yards of water in the sump at the time. Both the piping and men went into the sump. They would have fallen six yards to the top of the sump water. They would have been drowned in the sump. The bodies of Mannion and Meeson were found on Sunday afternoon, 21st July, and Piggford and Holmes on Sunday night, and all four men were brought out of the pit at 10 p.m. Thomas Shore, the enginewright, and John Radford, the master-sinker, were in charge of the pit at the time of the accident. Shore, Radford, and I were standing talking about 20 yards from the pit at the time of the accident. I supposed the four men to be in the shaft. Piggford was the charge-man of the sinkers, and he superintended the putting in of the pipes and screwing the joints. The other men had to obey his orders. Piggford received his orders from Shore and Shore from me.

By Mr. Clegg.—Elliott should have gauged the extra bunting from the copper lines before bricking it up. Elliott was the other charge-man. Elliott was on one shift and Piggford on the other. It

was a new shaft just completed from top to bottom. It had not been used for anything. No pipes have fallen before in this shaft. In the old shaft near to it the shaft side gave way and the pipes fell. Three lines of pipe fell, steam, water, and exhaust pipes.

(By Mr. Markham.)—The steam-pipes were stayed in the ordinary manner. The expansion of the pipes would have prevented them having been fixed. I have never known steam-pipes fixed in any other manner. The side pressure on the pipe would be about six cwt., *i.e.*, it would have taken that pressure to bring them to a central line. After this accident we shall double the buntings in other shafts as an extra safeguard, but these would have been sufficient if the orders had been obeyed. There would have been a risk in removing any strap, but the greater risk the deeper down the shaft.

Matthew Abbott, of Speedwell Terrace, Staveley, fitter:—

I had been working at the pit bottom of the new Hollingwood Shaft on Friday afternoon. I worked between the bottom of the shaft and an engine in the mine about 40 yards off. The place in which Piggford and his men were working was from six to eight yards above the pit bottom. I passed the four deceased as I went up. They were pulling the bricks out from behind a bunting as I passed them. I went steadily past. I did not say anything to them. As I passed them they asked me to bring them a spanner down. I came down the shaft again about three minutes before the accident. I passed them at the same bunting as I went down. I had forgotten the spanner. Piggford asked me if I had brought the spanner. I said I had not, but I had one at the bottom and would put it in a skip and send it up to him. They were waiting for the spanner, doing nothing, when I passed. I went to the bottom and sent them up a spanner in a skip. The skip reached the scaffold. Jonathan Piggford took the spanner out. He commenced undoing the nuts on the clams. I went away a little distance from the bottom. In a little over a minute I heard the pipes come down. They had oil lamps on the scaffolding. The scaffold was held up by four chains to the rope.

(Examined by Mr. Clegg.)—They were using the spanner, but I cannot say whether to screw or unscrew. They had time to unscrew two bolts before the accident after they received the spanner. They said they wanted the spanner for the clam bolts, a spanner to fit the clams.

(Examined by Mr. Markham.)—I am certain that they cut away the brickwork behind the buntings and wanted the spanner to screw or unscrew the bolts. Some time before I went up they told us that they were getting the brickwork out, and told us below to take care.

Arthur Holmes, of Staveley (Chesterfield Road), sinker:—

On Friday 19th July, at 20 minutes to 8 p.m., I was at the bottom of the New Hollingwood shaft in the archway. I went down at 2 p.m. Matthew Abbott had just come down and handed me a spanner which he found in the archway. I put it in a skip. I told Edward Holmes on the scaffold to "hold up" when he was ready for the spanner. He called to the engineman at the top to "hold up." I sent the spanner. Then I went away from the shaft before the spanner started, and had got about 20 yards away when I heard the pipes fall.

(Examined by Mr. Clegg.)—I went away from the bottom just before Abbott. At about half-past 7 p.m. Mannion told me to keep out of the way when he was picking some bricks out. I could see them picking them out from in front of the hay.

Thomas Shore, of Ireland Colliery, enginewright:—

I have charge of the sinking shaft at New Hollingwood for the job of putting in steam and water pipes. I was downthe shaft half an hour before the accident. I examined the steam and water pipes, the buntings and fastenings. At about 7 p.m. onFriday 19th July I gave orders to deceased (Piggford) at the pit top as he was going down. I told him that the pipes were a little bit out of line, and he was to take a little bit out of the (extra) bunting to let the pipes come into the straight line again, and he would get a new strap made and put on. Mr. Humble and I had talked about it the same day, and he gave the same order to me and to Piggford as well. I did not tell him to take off the strap. We were going to shove the pipes back with a screw-jack, and to put a new strap on to keep them tight when they wedged into their places. There are three shifts of sinkers. The men who went off at 8 a.m. screwed up the joints from the extra bunting for some distance upwards (perhaps 10 or 12 joints—30 or 40 yards). The other joints were screwed up by Piggford's shift of men. I knew that the deceased were in the shaft. I was talking to Mr. Humble against the lamp-cabin when the accident happened. I knew that the men were near the extra bunting. I have seen the extra bunting since. It is broken in two just against the outside bolt. The bolts are in good condition. The threads are perfect. I am sure that the nuts have been taken, not wrenched off. The bolts were some $\frac{5}{8}$ths, some $\frac{3}{4}$ths. In my opinion the men had taken away the straps, and so taken away the support from the pipes. The pipes were a little out of the perpendicular at that point. The strap is to hold the pipe from the wall and up to the bunting. Piggford had charge of the shift. He was a blacksmith, and a man of experience in pit sinking. The buntings go about 10 inches into the wall. They go into metal pockets. I think the pipes must have fallen from their having pushed it. The bunting broke from the pipes falling, and the pipes did not fall from the bunting breaking.

(Examined by Mr. Clegg.)—Mr. Humble gave instructions to Piggford that day and the day before. He said we were to cut two inches out of the buntings, or a little more if necessary, and to tighten the bolts up. They could not do that without a new strap. Piggford had been under my charge about a year and a half.

John Radford, of Clown, sinker:—

I am master sinker at New Hollingwood pit. I was 30 yards from the pit top when the pipes fell. I had nothing to do with the pipes down the shaft. I heard Mr. Humble on Friday, the 19th July, tell Piggford twice, both in the morning and in the afternoon; there were others present, at least the first time. Piggford was telling Mr. Humble about the extra bunting being a little bit out of plumb.

Humble told Piggford not to touch the bunting or the strap, but to take a little bit out of the back side, and if he did so it would cause it to go into its place gradually. It was only two inches out.

(Re-examined).—Mr. Humble did say Piggford was to cut two inches out of the bunting and tighten the bolts. The bunting was put in on Wednesday night by John Elliott—or Thursday.

No case of over-winding resulting in personal injury has been reported during the year; this is satisfactory, and it is a proof of the skill and judgment of the men handling the machines, and how wonderfully they are under control.

The shafts now being sunk along the eastern line of the coal-field, indeed all in the Leen Valley, are of great depth; the underground workings will have to be laid out so as to secure a large "out-put" of coal, and to do this means powerful large engines and good "tackle."

Safety-hooks are now very generally used; there is, however, a difference of opinion, some say they induce carelessness. I still think they are a necessary precaution, especially in very quick winding shafts.

Trams and Tubs, and Miscellaneous Accidents.

Thirteen lives lost by miscellaneous causes; this is very much below the average. The average of the past 10 years is over 20.

On the 8th of March, Thomas Farmer, 13 years of age, was run over and killed; he neglected to use lockers in the wheels.

Two boys riding on coupling-chains, and two others riding on full tubs, fell off, and the tubs passed over them.

On the 26th of May, at Boythorpe Colliery, some boys were playing on the pit bank after finishing their work; one of them turned the steam into the hoist cylinder; at once the hoist moved, struck one lad, inflicting fatal injury.

Many of these miscellaneous accidents are due to careless acts of the unfortunate sufferers, and I do not see that blame can be attributed to anyone save themselves, and they have the last penalty.

Two men were killed by being run over on the surface by railway trucks.

Ironstone Mines of the Coal Measures.

This year has passed away without an accident of any kind in the ironstone mines comprised in the Coal Mines Act.

The quantity of argillaceous ironstone raised is about 75,000 tons; these mines for the most part have at the end of this year been abandoned, and in very short time they will all be closed.

In these days the cost of production is so great that it is impossible to compete with other cheap ironstones.

The iron-works in Derbyshire are supplied direct from Northamptonshire at a cheap rate; the ironstone is near to the surface; it is simply a matter of loading into railway truck.

The Order of St. John of Jerusalem in England.

The ambulance department of this society is doing good work in this colliery district. Major Francis Duncan, R.A., Director of the Ambulance Department, Order of St. John, first introduced the subject in a most earnest and eloquent speech before the members of the Institute of Engineers at Chesterfield, Lord Edward Cavendish presiding. He pointed out the object of the society was to teach people generally how to act in cases of accidents; how to treat the patient so that he may suffer the least possible amount of pain; how to save life from hemorrhage resulting from accident; to act on emergency until such time as a medical man can see the patient.

The first centre was inaugurated at Clay Cross Collieries by a successful public meeting on the 10th of July, at which the Order was represented by Major Duncan, Mr. Charles Binns presiding. Classes were subsequently formed at Tibshelf; president Lt. Col. Seely; and others Blackwall, Babbington, Chesterfield, &c. Several hundred pupils have received certificates of competency, and already two lives have been saved by colliers, members of this society. Surely in colliery districts, so often the scene of accident, it is of the utmost importance that a collier should know what to do in case of injury to a fellow workman, perhaps no assistance within hundreds of yards, away in a remote and distant part of the mine. It is due to Major Duncan, and we most cordially tender our most sincere thanks to him for the courage and perseverance he has shown in pressing forward the claims of the society when success appeared hopeless.

The society's report contains the following words: "The Committee feel that had the "ambulance work of the Order never extended beyond the group of Derbyshire collieries, "the reward to those originating it would have been ample."

Managers' Certificates.

The Board for the appointment of examiners meet at Derby once in each year. They appoint gentlemen to examine applicants for certificates, and they arrange the subjects, leaving the questions to the examiners.

The examination, as arranged at present, takes place in October.

Up to the end of this year, separate examinations have taken place. Ninety-one candidates have passed and gained certificates.

In consequence of the lamented death of an old and valued friend of the Board, Mr. J. T. Woodhouse, who for many years held the highest position in the profession as a civil and mining engineer, it was your pleasure to appoint Mr. J. Jackson a member of the Board, and Mr. S. C. Wardell, of Tibshelf and Birchwood, to be an examiner.

Board for the Appointment of Examiners.

The following gentlemen constitute the Board for the appointment of examiners:—

Colliery Owners - -	Charles Seely, Esq., Sherwood Lodge, Notts. (Chairman). F. B. Wright, Esq., Aldecar Hall, Derby. George Skey, Esq., Tamworth.
Mining Engineers, &c. &c.	Charles Binns, Esq., Clay Cross Hall. J. P. Jackson, Esq., Clay Cross. George Vaughan, Esq., Snibstone.
Three persons not being Owners, Agents, &c. of mines.	Mr. Paxton, Eastwood. Mr. Davis, Clay Cross. Mr. Matthews, Langley Mill.
Her Majesty's Inspector of Mines.	Thomas Evans, Esq., Derby.

Board for Examinations for the Mining Districts of Nottinghamshire, Derbyshire, Leicestershire, and Warwickshire.

The Wardwick,
Derby, 187 .

Sir,

I am directed by the Chairman of the Board of Examinations for these districts to inform you that the Secretary of State has been pleased to order the next examination of candidates for certificates of competency within the above districts to be held in the town of Derby, in the county of Derbyshire, on the day of October next, and that such examination will be held accordingly at on that day, commencing at o'clock in the morning.

It will be necessary for you to present yourself punctually at the hour appointed.

The following gentlemen have been appointed examiners:

S. C. Wardell, Esq., M.E., Doe Hill, Alfreton.
John Peter Jackson, Esq., M.E., Stubbing Edge, Chesterfield, Derbyshire.
Reuben Smallman, Esq., M.E., Nuneaton, Warwickshire.

It is impossible to fix beforehand the length of time which the examination may occupy, but it is not probable that your attendance will be required for more than two days.

The subjects fixed for examination are the following:

1. Writing.
2. Arithmetic.
3. The winning and working of mines of coal, mines of stratified ironstone, mines of shale, and mines of fireclay.
4. Machinery.
5. Ventilation.
6. Safety of mines and miners, and opening works after having been closed for a period.
7. Surveying and plans.

The candidates will be examined in reading, and will also be examined vivâ voce upon all the foregoing subjects.

Candidates for examination must be of the full age of 23 years.

Every Candidate for examination for a certificate of competency will be required to sign an undertaking to keep the information contained in the examination papers strictly private and confidential, and also engage not to take a copy of any portion of such paper, or publish the same in any way.

It will be necessary for you, before your examination can be proceeded with, to produce to the examiners:

1. Your authorization from the Secretary of State to appear for examination. (The fee payable for this authorization is 2*l.*, which should be remitted by means of a Post Office Order on the General Post Office, London, payable to Charles Erskine, Esquire, Home Office, Whitehall).
2. The prescribed evidence as to character, consisting of—

(*a.*) A statement of the situations you have filled during the last five years, to which a declaration must be appended that all the allegations are true; such declaration being signed by you in the presence of one witness.

(*b.*) Testimonials from two persons (whose addresses must be given) as to your sobriety, experience, ability, and general good conduct.

Upon the first point, you must address your application for authority to appear before the Board, to Her Majesty's Principal Secretary of State for the Home Department, Whitehall, London.

Upon the latter point, the Board for Examinations, has decided that Candidates must produce:

1. Certificates of sobriety and general good conduct, signed by the employer, if any, or by a clergyman or other minister, or magistrate, *and* two respectable residents in his district.
2. Certificates of ability and experience from the employer, if any; or from two competent persons (mining engineers or others) acquainted with mining operations.

I am, Sir,
Your obedient Servant,
WILLIAM SAUNDERS.
Secretary.

Mr.

RETURN of the number of candidates who presented themselves at the several examinations, showing the number passed by examiners since the passing of the Act in the year 1872.

Date of Examination.	Number of Candidates.	Number passed.
1873.—May 13th and 14th	30	20
1874.—January 8th and 9th	47	34
1874.—July 9th and 10th	23	4
1875.—January 13th and 14th	14	6
1875.—October 28th and 29th	26	12
1876.—October 24th and 25th	24	7
1877.—October 30th and 31st	13	5
1878.—October 30th and 31st	14	3
	191	91

The Wardwick, Derby,
15th March, 1878.

List of Certificated Managers acting and obtained Certificates in the Midland District.

Note.—Those marked * did not obtain their Certificates in the Midland District.

Name.	No. of Certificate.	Date.	S—Service. C—Competency.	Name of Colliery where acting, or other Occupation.
Adcock, Charles F.	1,665	6 June 1873	S	Not acting.
*Addy, William Francis	806	10 July 1876	C	Dronfield Silkstone.
Addenbrooke, John Gordon	138	6 Feb. 1873	S	Not acting.
Alsop, Samuel	432	26 Feb. 1874	C	Heage.
Allen, Reuben	1,751	9 June 1873	S	Albert.
Allport, Howard, Aston	1,373	27 May 1873	S	Bestwood.
Allsop, Samuel	418	26 Feb. 1874	C	Not acting.
Appleby, Charles E.	727	31 Mar. 1873	S	Not acting.
Ashworth, David	491	18 Mar. 1873	S	Birch Vale.
*Ashton, David	666	5 July 1875	C	Skegby.
Atkinson, J. R.	423	26 Feb. 1874	C	Assistant Manager.
Baker, Godfrey	870	14 Dec. 1876	C	Underviewer.
Bailey, Samuel	710	29 Mar. 1873	S	
Bamford, Benjamin	1,492	31 May 1873	S	Grassmoor.
*Barker, George	49	10 Jan. 1873	S	Bedworth.
Barton, Samuel Richard	245	21 Feb. 1873	S	Wilnecote.
*Barnes, Richard, John	115	31 Jan. 1873	S	Birley Vale.
Bell, Thomas	109	31 Jan. 1873	S	Inspector of Mines.
Belfitt, W.	711	26 Nov. 1875	C	Underviewer.
Bennett, James	60	13 Jan. 1873	S	Not acting.
Bircumshaw, Joseph	431	26 Feb. 1874	C	Underviewer.
Boole, William	1,745	9 June 1873	S	Berristow Lane.
Boosham, John	924	18 April 1873	S	Glascote.
*Booth, Edwin	1,528	2 June 1873	S	Stretton.
Bowler, George	541	17 Mar. 1873	S	Pentrich.
Bourn, Thomas	1,875	13 June 1873	S	Rawdon.
Bourne, Thomas W.	1,039	27 Nov. 1877	C	Not acting.
Bradshaw, Thomas	1,850	12 June 1873	S	Oakthorpe.
*Bragge, George S.	683	9 July 1875	C	Not acting.
Brown, Daniel	1,071	1 May 1873	S	Fallswood.
Braddock, Joseph C.	2,132	13 Aug. 1873	S	Not acting.
Bridgett, William	407	26 Feb. 1874	C	Nailstone.
Burgoyne, Henry	424	26 Feb. 1874	C	Underviewer.
Buxton, William	102	27 Jan. 1873	S	Deceased.
*Burdess, William	795	7 April 1873	S	Oakerthorpe.
Buxton, German	712	26 Nov. 1875	C	Reservoir.
Buxton, Samuel	710	26 Nov. 1875	C	Deceased.
Carr, J., junr.	2,191	3 Sept. 1873	S	
Carr, J. G.	1,232	15 May 1873	S	Not acting.
*Carr, Ebenezer E.	668	6 July 1875	C	Southgate.
Cater, Thomas	1,167	21 Nov. 1878	C	
Campbell, James	747	2 April 1873	S	Not acting.
Chambers, William Hoole	17	8 Jan. 1873	S	
Chadborn, Becket Thomas	1,334	26 May 1873	S	Pinxton.
Chambers, Isaac	82	23 June 1873	C	
Chambers, Alfred	430	26 Feb. 1874	C	Underviewer.
Chambers, William	437	26 Feb. 1874	C	
Chambers, William Henry	871	14 Dec. 1876	C	
Chamberlain, Geo. Wm.	713	26 Nov. 1875	C	Underviewer.
Clark, William	985	22 April 1873	S	Teversall.
Clarke, William	1,877	13 June 1873	S	Underviewer.
Clarke, Herbert	2,411	13 June 1874	S	Not acting.
Clayton, Abel	2,222	16 Sept. 1873	S	Aspenshaw.
Coke, Rd. Geo.	547	18 Mar. 1873	S	Mining Engineer.
Corfield, Frederick Channer	426	26 Feb. 1874	C	Assistant Manager.
*Cowen, William Field	838	10 April 1873	S	Molyneux.
*Cox, Samuel Clifford	793	17 Mar. 1876	C	Assistant Manager.
Creswell, Robert E.	546	12 Aug. 1874	C	Gresley.
Crondace, Thos. Dacre	639	25 Mar. 1873	S	Clay Cross.
Cunliffe, Joseph	409	6 Mar. 1873	S	Hawkesbury Lane.
Dallas, Hugh Whinney	18	8 Jan. 1873	S	Not acting.
Darlington, Samuel	174	12 Feb. 1873	S	Not acting.
Darling, Fenwick	599	22 Mar. 1873	S	
Davis, Ezra	90	23 June 1873	C	Not acting.
Davies, James	405	26 Feb. 1874	C	
Davies, William	2,055	12 July 1873	S	
Day, William	199	13 Feb. 1873	S	
Day, William	81	23 June 1873	C	

Name.	No. of Certificate.	Date.	S—Service. C—Competency.	Name of Colliery where acting, or other Occupation.
Dickinson, Thos. L.	58	13 Jan. 1873	S	Not acting.
Dooley, Edmund	89	23 June 1873	C	
Eardley, John W.	635	27 Mar. 1875	C	Not acting.
Eardley, Edwin	1,840	12 June 1873	S	Swanwick.
Eaton, John	1,323	23 May 1873	S	Cossall.
Eley, William	301	25 Feb. 1873	S	Not acting.
Eley, Richard	2,244	14 Oct. 1873	S	
Eley, Alfred	421	26 Feb. 1874	C	Swadlincote.
Eley, John	1,863	13 June 1873	S	
Elliott, Amos	1,173	8 May 1873	S	Heather.
Etchells, David	2,070	18 July 1873	S	Not acting.
Evans, David	32	9 Jan. 1873	S	
Fearn, John Wilmot	1,215	14 May 1873	S	Rutland.
Fenn, Simeon	1,798	10 June 1873	S	Tame Valley.
Fenn, Hezekiah	714	26 Nov. 1875	C	Enginewright.
Fisher, Henry	9	8 Jan. 1873	S	Clifton.
Fowler, George	365	3 Mar. 1873	S	Cinder Hill.
Fowler, Walter Carrington	404	26 Feb. 1874	C	Stanton.
Gillett, Francis Calvert	1,187	9 May 1873	S	Not acting.
Gilroy, Samuel Bertram	76	15 Jan. 1873	S	Powell Duffryn.
Grayston, Frederick Arthur	316	27 Feb. 1873	S	Amington.
Gregory, John B.	81	21 Jan. 1873	S	Not acting.
Greensmith, Johnson	80	23 June 1873	C	Underviewer.
Gresley, William S.	872	14 Dec. 1876	C	Not acting.
Godber, John	429	26 Feb. 1874	C	Pit bank manager.
Godber, Samuel	549	12 Aug. 1874	C	Pilsley
Gosling, Frederick	1,372	27 May 1873	S	Hollingwood.
Hague, Samuel	76	23 June 1873	C	Owl Coates.
Hague, William Butler	420	26 Feb. 1874	C	Not acting.
*Hague, Ernest	804	28 June 1876	C	Cottam.
*Hale, Henry	2,197	8 Sept. 1873	S	Nuneaton.
Hall, William	889	15 April 1873	S	Lodge.
Hall, Joseph	1,402	28 May 1873	S	
Hall, Samuel	2,581	26 July 1878	S	
Hancox, John	428	26 Feb. 1874	C	
Hardy, William	715	26 Nov. 1875	C	Underviewer.
Hardy, Godfrey	1,851	12 June 1873	S	Not acting.
Harrison, Robert	1,238	16 May 1873	S	Not acting.
Harrison, Ralph	1,858	13 June 1873	S	Griff.
Harrison, John	1,812	11 June 1873	S	Exhall.
Harrison, Jonathan	86	23 June 1873	C	Not acting.
Harrison, George	427	26 Feb. 1874	C	
Hardwick, Mylles	79	23 June 1873	C	Underviewer.
*Harper, John Povey	1,059	24 Dec. 1877	C	Stanley.
Harvey, J.	1,040	27 Nov. 1877	C	
Havenhand, Fred	1,799	10 June 1873	S	Deceased.
Hawley, John	716	26 Nov. 1875	C	West Hallam.
Hedley, Edward	792	5 April 1873	S	Granville.
Henshaw, John	78	23 June 1873	C	Not acting.
*Heslop, James	917	17 April 1873	S	Hucknall.
Hewitt, George	1,023	25 April 1873	S	Unstone.
Hewitt, Thomas	1,509	2 June 1873	S	Not acting.
Hey, William	717	26 Nov. 1875	C	Assistant manager.
Hepplewhite, William	425	26 Feb. 1874	C	Underviewer.
Hicks, Philemon	2,332	14 Jan. 1874	S	Not acting.
Higson, John	387	5 Mar. 1873	S	Mining Engineer.
Hill, Robert	1,041	27 Nov. 1877	C	Assistant manager.
Hodgkinson, Job	77	23 June 1873	C	Underviewer.
Holford, William D.	46	10 Jan. 1873	S	Whittington Silkstone.
Holbrook, William	1,683	6 June 1873	S	Deputy.
Holbrooke, James	1,853	12 June 1873	S	Not acting.
Hopkins, William	1,565	3 June 1873	S	Not acting.
Houfton, Elijah	352	1 Mar. 1873	S	Renishaw.
Houfton, Charles	87	23 June 1873	C	
Howe, George	88	23 June 1873	C	Not acting.
Howe, Robert	434	8 Mar. 1873	S	Netherseal.
Howard, William Frederick	1,297	22 May 1873	S	New Brampton.
Hubbersty, H. A	1,631	5 June 1873	S	Not acting.
Humble, R.	1,042	27 Nov. 1877	C	
*Humble, Joseph	104	27 Jan. 1873	S	Staveley.
Hunt, Uriah	886	15 April 1873	S	Denby.
Hyde, Joseph	1,731	7 June 1873	S	Bugsworth.

Name.	No. of Certificate.	Date.	S—Service. C—Competency.	Name of Colliery where acting, or other Occupation.
Jackson, John Peter	332	28 Feb. 1873	S	Examiner for Certificates.
Johnson, William	695	28 Mar. 1873	S	Bretby.
Jones, John	965	21 April 1873	S	Shireoaks.
Jones, William	408	26 Feb. 1874	C	
Knight, Edward	504	13 Mar. 1873	S	Not acting.
Knighton, Henry Amos	75	23 June 1873	C	Springfield.
Lamb, George	73	23 June 1873	C	Underviewer.
*Lancaster, Geo. William	995	3 July 1877	C	Heath End.
Laverick, Geo. Wales	59	13 Jan. 1873	S	Riddings.
*Leech, Arthur H.	881	5 Jan. 1877	C	Assistant manager.
Lewis, Henry	33	9 Jan. 1873	S	Annesley.
Lewis, George	569	19 Mar. 1873	S	Wollaton.
Longden, John Alfred	16	8 Jan. 1873	S	Blackwell.
Longden, Lewis	74	23 June 1873	C	Underviewer.
Lord, Edmund	1,245	16 May 1873	S	
Lupton, Arnold	417	26 Feb.	C	Leeds Mining College.
Lyon, Edward	873	14 Dec. 1876	C	
Mackay, B. G.	635	27 Mar. 1875	C	
Marshall, Isaac	2,435	19 Oct. 1874	S	Mellor.
Martin, Robert F.	434	26 Feb. 1874	C	Not acting.
Mason, Joseph	846	10 April 1873	S	Underviewer.
*May, C.	327	3 Dec. 1873	C	Temple Normanton.
Millership, Thomas	1,330	26 May 1873	S	Certificate cancelled.
*Millward, Joseph	2,477	25 May 1875	S	Kettlebrook.
Minnikin, William	410	26 Feb. 1874	C	St. John's, Staveley.
*Moody, William	596	8 Feb. 1875	C	
Morgan, Charles Rennie	817	8 April 1873	S	Tibshelf.
Morgan, George	801	8 April 1873	S	Birch Coppice.
*Mosby, George	671	6 July 1875	C	Holbrook.
*Mosby, John	2,380	25 Mar. 1874	S	Underviewer.
Naylor, Thomas	1,626	4 June 1873	S	Not acting.
Naylor, Henry	409	26 Feb. 1874	C	Brockwell.
Nowell, William	31	9 Jan. 1873	S	Deceased.
Nowell, John	2,515	4 May 1876	S	Haunch Wood.
*Park, John	132	27 June 1873	C	Hundall.
Parker, George	402	6 Mar. 1873	S	
Parker, John	1,881	14 June 1873	S	Baddesley.
Pendleton, William	718	26 Nov. 1875	C	Pilsley.
Percival, George	1,168	21 Nov. 1878	C	Alvecote.
*Phillips, Herbert	141	3 July 1873	C	Digby.
*Phillips, N.	946	18 Jan. 1877	C	Underviewer.
Pickering, Jonathan	1,738	7 June 1873	S	Collier working in the pit.
	72	23 June 1873	C	
Platts, James	1,785	10 June 1873	S	
Radford, Joseph	2,421	3 July 1874	S	Underviewer.
Radford, George	435	26 Feb. 1874	C	Underviewer.
Radford, William	1,817	11 June 1873	S	Underviewer.
Randall, Humphrey	1,789	10 May 1873	S	Harts Hill.
Rangeley, William Henry	2,109	31 July 1873	S	Not acting.
*Read, William	1,291	22 May 1873	S	Bestwood.
Redgate, John	415	26 Feb. 1874	C	Not acting.
Redhead, Robert H.	719	26 Nov. 1875	C	Rangeleys Drift.
Rhodes, Jeremiah	720	26 Nov. 1875	C	Shirland.
Rhodes, Jonathan	1,696	7 April 1873	S	Summerley.
Richards, John	1,777	10 June 1873	S	Deceased.
Robinson, Robert Henry	411	26 Feb. 1874	C	Monkwood.
Robinson, P.	71	23 June 1873	C	
Sanders, Henry	412	26 Feb. 1874	C	Craven.
Seddon, Peter	2,510	11 Mar. 1876	S	Underviewer.
Senior, Edward	998	23 April 1873	S	Highfield.
Shaw, W. H.	433	26 Feb. 1874	C	Underviewer.
Shemwell, Geo.	2,465	9 Mar. 1875	S	Fair Oaks, Stafford.
Simpson, Robert	361	3 Mar. 1873	S	
Simpson, R.	436	16 Jan. 1874	C	
Slack, John	874	14 Dec. 1876	C	Ansley Hall.
Smallman, Reuben	592	21 Mar. 1873	S	Examiner for Certificates.
Small, George	616	22 Mar. 1873	S	Kilburne.
Smith, John	2,280	20 Nov. 1873	S	
Smith, Robert Abram	875	14 Dec. 1876	C	Whitwick.
*Smith, Herbert	583	20 Mar. 1873	S	North Wingfield.
Southall, Alfred	85	23 June 1873	C	
Springthorpe, Joseph	637	29 Mar. 1875	C	Cutthorpe.
Spruce, Samuel	5	8 Jan. 1873	S	Not acting.

Name.	No. of Certificate.	Date.	S—Service. C—Competency.	Name of Colliery where acting, or other Occupation.
Srigley, Thomas	195	13 Feb. 1873	S	Whaley Bridge.
Standley, W.	1,043	27 Nov. 1877	C	
Stenson, Foster	548	12 Aug. 1874	C	Not acting.
Stevenson, Robert	84	23 June 1873	C	Newstead.
Stokes, Arthur Henry	1,505	31 May 1873	S	Inspector of Mines.
*Straw, Michael	951	18 Jan. 1877	C	Boythorpe.
*Strain, John	732	1 April 1873	S	Ibstock.
*Strick, Rich. Jose	35	4 June 1873	C	Butterley.
Swann, William	70	23 June 1873	C	Northfield.
Swann, Joseph	737	1 April 1873	S	Deceased.
Tankard, John William	413	26 Feb. 1874	C	Norwood.
*Tate, W. J.	974	26 Feb. 1877	C	Enginewright.
Taylor, Thomas	1,069	1 May 1873	S	
Taylor, Henry	638	27 Mar. 1875	C	Donisthorpe.
*Thomas, Davey	261	31 July 1873	C	Kettlebrook.
Thomlinson, William	96	25 Jan. 1873	S	Denby.
Truman, John	83	23 June 1873	C	
Vardy, Isaac	2,238	9 Oct. 1873	S	Deceased.
Walters, John	1,169	21 Nov. 1878	C	
Walters, Henry	1,480	31 May 1873	S	
Walters, James	1,861	13 June 1873	S	
Walters, Hargreave	416	26 Feb. 1874	C	Coton Park
Walters, Joseph	640	27 Mar. 1875	C	Deceased.
Warburton, William	1,760	9 June 1873	S	
Wardle, Thomas	721	26 Nov. 1875	C	
Wardell, Stewart Crawford	506	13 Mar. 1873	S	Tibshelf. Examiner for Certificates.
Ward, John	904	16 April 1873	S	Wingerworth.
Watson, Simeon	406	27 Feb. 1874	C	New Hucknall.
Wells, Joseph	2,051	8 July 1873	S	Deceased.
Wells, William Edwin	438	15 June 1874	C	Renishaw Park.
Weston, William	822	9 April 1873	S	Barber Walkers.
Wheatley, Samuel	422	26 Feb. 1874	C	Underviewer.
Wheeler, Harold George	639	27 Mar. 1875	C	
White, Jason, Herriott Reeves	547	12 Aug. 1874	C	Snibston.
Whitehead, Samuel	750	2 April 1873	S	Awsworth.
Whittem, Thos. Sybel	680	27 Mar. 1873	S	Wyken.
*Wild, John George	1,508	2 June 1873	S	Ellistown.
Wilde, William	4	6 Jan. 1873	S	Sheepbridge.
Williams, William	1,794	10 June 1873	S	
Williams, John	43	4 June 1873	C	Hockley Hall.
Wilson, Thos. Allen	414	26 Feb. 1874	C	Old Swadlincote.
Wilson, George	1,879	14 June 1873	S	Bagworth.
*Wilson, Stephen	529	21 July 1874	C	Pooley Hall.
Wright, Henry	876	14 Dec. 1876	C	Mineral surveyor.
Wright, Geo. Henry	787	5 April 1873	S	Not acting.
Wright, C. Tylden	828	9 April 1873	S	Shireoaks.

TABLE No. 3.

SUMMARY of separate Colliery Accidents in the Midland District during the years 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, and 1878.

	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Explosions of fire-damp	2	1	5	1	5	7	4	3	1	1	1	—
Falls of roof	25	24	31	22	31	36	37	23	26	41	29	29
Shafts	11	9	11	6	5	8	10	6	16	7	6	7
Miscellaneous	21	24	23	18	15	23	24	20	21	17	15	13
Total accidents	59	58	70	47	56	74	75	52	64	66	51	49

SUMMARY OF LIVES LOST BY THE ACCIDENTS.

	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Explosions of fire-damp	4	1	6	2	42	7	4	3	1	6	1	—
Falls of roof	25	24	31	22	31	38	39	23	26	46	30	31
Shafts	11	9	12	6	5	8	10	6	17	8	6	11
Miscellaneous	24	26	29	20	15	26	25	23	21	17	21	13
Total deaths	64	60	78	50	93	79	78	55	65	77	58	55

Shafts.

Falling from surface and part way down	1	5	6	5	4	5	4	—	6	2	—	1
Things falling from surface	2	—	2	1	—	2	1	—	2	—	—	—
„ „ part way down	1	1	1	—	—	—	—	—	2	1	3	6
Ropes and chains breaking	—	1	—	—	—	—	—	2	—	—	1	1
Whilst ascending and descending	5	1	1	—	—	—	5	2	2	3	2	1
Explosion of powder	—	1	—	—	—	—	—	—	1	—	—	—
Overwinding	1	—	—	—	—	—	—	—	—	2	—	—
Suffocated in shaft	1	—	—	—	—	—	—	—	2	—	—	—
Fell under carriage at shaft bottom	—	—	1	—	—	—	—	—	1	—	—	1
Jammed against shaft side, pumps giving way	—	—	1	—	—	—	—	—	—	—	—	—
Drowned in sump	—	—	—	—	1	1	—	—	—	—	—	—
Falls whilst at pumps	—	—	—	—	—	—	—	2	—	—	—	—
Brick-work in the shaft gave way	—	—	—	—	—	—	—	—	1	—	—	—
Mistaken signalling	—	—	—	—	—	—	—	—	—	—	—	1
Total	11	9	12	6	5	8	10	6	17	8	6	11

Miscellaneous.

Burnt by paraffine	—	—	—	—	—	—	—	—	1	—	—	—
Explosions of gunpowder	5	8	1	2	2	1	—	2	1	2	1	1
Suffocation by gases	1	2	—	5	—	—	2	3	—	—	7	—
On incline planes	2	7	6	3	3	9	8	6	1	4	4	2
By tubs and trams	12	5	7	3	7	8	9	8	11	7	2	5
Boilers bursting	3	—	4	1	—	—	—	—	—	—	—	—
Machinery underground	—	—	—	2	—	2	—	1	—	—	1	—
Machinery (on surface)	1	1	3	4	1	2	2	2	2	3	2	3
Run over „ „ or crushed between buffers	—	3	2	—	1	4	—	—	1	1	2	2
Kicked by a horse	—	—	1	—	—	—	2	—	1	—	1	—
Inundation	—	—	4	—	—	—	—	—	—	—	—	—
Drawn on to drum by a rope of an incline	—	—	1	—	—	—	—	—	—	—	—	—
Fall from building	—	—	—	—	1	—	—	—	—	—	—	—
Crushed by a rope on incline	—	—	—	—	—	—	1	—	—	—	—	—
Run over in crossing points	—	—	—	—	—	—	1	—	—	—	—	—
Door falling	—	—	—	—	—	—	—	1	—	—	—	—
Cage at pit bottom	—	—	—	—	—	—	—	—	3	—	—	—
Fell on pit rails	—	—	—	—	—	—	—	—	—	—	1	—
Total	24	26	29	20	15	26	25	23	21	17	21	13

List of Non-fatal Accidents reported under the Coal Mines Regulation Act, in Mr. Thomas Evans' District, 1878.

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
	DERBYSHIRE.													
Andrew, Brothers, Dronfield	Silkstone Main	–	1	–	–	–	–	–	–	–	–	–	–	1
Andrew and Son, Compstall, Stockport	Compstall Road	–	–	–	–	–	–	–	–	–	–	–	–	–
Arkwright, William, Sutton, Chesterfield	Sutton	–	–	–	–	–	–	–	–	–	–	–	–	–
Aspenshaw Coal Company, Hayfield, Stockport	Aspenshaw Tunnel	–	–	–	–	–	–	–	–	–	–	–	–	–
Alton Coal and Coke Company, Chesterfield	Alton, Nos. 1 and 2	–	–	–	–	–	–	–	–	–	–	–	–	–
Ball, William, Ilkeston	Dodson	–	–	–	–	–	–	–	–	–	–	–	–	–
Badger, A. and W. T.	Fallswood	–	–	–	–	–	–	–	–	–	–	–	–	–
Baghurst & Co., Ambergate	Ambergate	–	–	–	–	–	–	–	–	–	–	–	–	–
Bainbridge, E. M., & Co.	Hundall	–	–	–	–	–	–	–	–	–	–	–	–	–
Barton, Francis	Wigwell	–	–	–	–	–	–	–	–	–	–	–	–	–
Barnes, Messrs., Grassmoor, Chesterfield	Dunston, No. 1	–	1	1	–	–	–	–	–	–	–	–	–	2
	Silkstone, No. 2	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ell, No. 3	–	1	–	–	1	–	–	1	–	–	–	1	4
Beardsley, John	Ormonde	–	–	–	–	–	–	–	–	–	–	–	–	–
Bennett, Thomas, New Mills, Stockport	Birch Vale	–	–	–	–	–	–	–	–	–	–	–	–	–
	Bugsworth	–	–	–	–	–	–	–	–	–	–	–	–	–
	High Lea	–	–	–	–	–	–	–	–	–	–	–	–	–
	Shawmarsh	–	–	–	–	–	–	–	–	–	–	–	–	–
Benton and Woodiwiss	Shirland	–	–	–	–	–	–	–	–	–	–	–	–	–
Bingham, Richard	Cowley	–	–	–	–	–	–	–	–	–	–	–	–	–
Bircumshaw and Son, Clay Cross	Newmarket	–	–	–	–	–	–	–	–	–	–	–	–	–
Black, C., and Company	Renishaw	–	–	–	–	–	–	–	–	–	–	–	–	–
Blackwell Colliery Company, Limited, Alfreton	A. Winning, No. 1	–	–	–	–	–	–	–	–	–	–	–	–	–
	,, No. 2	–	–	–	–	–	–	–	–	–	–	–	–	–
	B. Winning, No. 3	–	–	–	–	–	–	–	–	–	1	–	–	1
	,, No. 4	–	–	–	–	–	–	–	–	–	–	–	–	–
Boam, H.	Dunstead	–	–	–	–	–	–	–	–	–	–	–	–	–
Bostock and Company	Carr Close	–	–	–	–	–	–	–	–	–	–	–	–	–
Booker, William, and Company	Woodhouse	–	–	–	–	–	–	–	–	–	–	–	–	–
Bridden, W. and H.	Brockwell	–	–	–	–	–	–	–	–	–	–	–	–	–
Brocklehurst, Thomas	Dousell	–	–	–	–	–	–	–	–	–	–	–	–	–
Butterley Iron and Coal Company, Alfreton	Butterley Park	–	–	–	–	–	–	–	–	–	–	–	–	–
	,, Nos. 1, 2, 3, and 5	–	–	–	–	–	–	–	–	–	–	–	–	–
	Forty Horse	–	–	1	–	–	–	–	–	–	–	–	–	1
	Britain	–	–	–	–	1	–	–	–	–	–	–	–	1
	Brands	–	–	–	–	–	–	–	–	–	–	–	–	–
	Western	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ripley, Nos. 1 and 2	–	–	–	–	–	–	–	–	–	–	1	–	1
	Hartshay	1	–	–	–	–	–	–	–	–	–	–	–	1
	Waingroves	–	1	–	–	–	–	–	–	–	–	–	–	1
	Railway	–	–	–	–	–	–	–	–	–	–	–	–	–
	Whiteley	–	–	–	–	–	–	–	–	–	–	–	–	–
	Calley	–	–	–	–	–	–	–	–	–	–	–	–	–
	Brickyard	–	–	–	–	–	–	–	–	–	–	–	–	–
	New Main, Nos. 7 & 8	–	–	–	–	–	–	–	–	–	–	–	–	–
	Exhibition	–	–	–	–	–	–	–	–	–	–	–	–	–
	Birchwood	–	–	–	–	–	–	–	–	–	–	–	–	–
	Denby Hall, Nos. 1 & 2	–	–	–	–	–	–	–	–	–	–	–	–	–
	Langley	–	–	–	–	–	–	–	–	–	–	–	1	1
	Bailey Brook	–	–	–	–	–	–	–	–	–	–	–	–	–
	Loscoe	–	–	–	–	–	–	–	–	–	–	–	–	–
	Granby, Nos. 1, 2, & 3	–	–	–	–	–	–	–	–	–	–	–	–	–
Buxton Lime Company, Buxton	Axe Edge	–	–	–	–	–	–	–	–	–	–	–	–	–
	Thatchmarsh	–	–	–	–	–	–	–	–	–	–	–	–	–
	Whaley	–	–	–	–	–	–	–	–	–	–	–	–	–
	Horwich Tunnel	–	–	–	–	–	–	–	–	–	–	–	–	–
Bourne & Co., Denby	Denby Pottery	–	–	–	–	–	–	1	–	–	–	–	–	1
Bramhall, Edward, Birley Lane, Eckington	Birley Moor	–	–	–	–	–	–	–	–	–	–	–	–	–
Chambers, Edward	Tibshelf	–	–	–	–	–	–	–	–	–	–	–	–	–
	Spaw Croft	–	–	–	–	–	–	–	–	–	–	–	–	–
	Dimminsdale (Old)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ditto (New)	–	–	–	–	–	–	–	–	–	–	–	–	–

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Chesterfield and Boythorpe Coal Company	Boythorpe Lane (Silkstone)	1	–	–	1	–	–	–	–	–	–	–	1	3
	Ditto (Tupton)	1	–	–	–	–	–	–	–	–	–	1	1	3
	Renishaw	–	–	1	–	1	–	–	–	–	–	–	–	2
Church and Maples, Burton-on-Trent	Old Swadlincote	–	–	–	–	–	–	–	–	–	–	1	–	1
	Stanhope	–	–		–	–	–	–	–	–	–	–	–	–
	Woodfield	–	–	–	–	–	–	–	–	–	–	–	–	–
Clay Cross Iron and Coal Company, Sir W. Jackson, Bart.	Cannel, No. 3	–	–	–	–	–	–	–	1	–	–	–	–	1
	Clay Cross, Nos. 1, 2	1	1	–	1	–	–	–	–	–	–	1	–	4
	Moreton, Nos. 5, 6	–	1	–	1	1	1	2	–	–	2	1	1	10
	North Wingfield, No. 7	–	–	1	2	–	–	–	–	–	1	–	–	4
	Park House, No. 4	–	1	–	–	2	–	–	–	–	2	–	–	5
	No. 8, Clay Cross	1	–	–	–	–	–	–	–	–	–	–	–	1
Coke and Company, Alfreton	Carnfield (Hard)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ditto (Soft)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Langton	–	–	–	–	–	–	–	–	1	–	–	–	1
	Pinxton	–	–	–	–	–	–	–	–	–	–	–	–	–
	Sleights, Nos. 1 and 6	–	–	–	–	–	–	–	–	–	–	–	1	1
Cotterill, William	Woodville	–	–	–	–	–	–	–	–	–	–	–	–	–
Coton Park Colliery Company	Coton and Lenton	–	–	–	–	–	–	–	–	–	–	–	–	–
Countess of Chesterfield, Burton-on-Trent	Bretby, Nos. 1, 2, 3	2	–	1	1	1	–	–	–	1	2	1	–	9
	Bretby, New	–	–	–	–	–	–	–	–	–	–	1	1	2
Cursham, Wm. G.	Heage	–	–	1	–	–	–	–	–	–	–	–	1	2
Dawes, George and W. H., and Company	Salterwood (Old)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ryefield, Nos. 1 and 2	–	–	–	–	1	1	–	–	–	–	–	–	2
Derbyshire Silkstone Coal Company, Chesterfield	Albert	1	–	–	1	–	–	1	–	–	2	1	–	6
Dronfield Silkstone Coal Company	Dronfield Silkstone	–	–	–	–	–	–	–	–	–	–	–	–	–
	Gosforth	–	–	–	–	–	–	–	–	–	–	–	–	–
Evans, Richard, Ilkeston	Newthorpe Lodge	–	–	–	–	–	–	–	–	–	–	–	–	–
Evans, Wigfield, and Company	St. John's, Staveley	–	–	–	–	–	–	–	–	–	–	–	–	–
Fletcher Henry Heanor	Heanor Lane	–	–	–	–	–	–	–	–	–	–	–	–	–
Galloway, Messrs., Manchester	Owl Coates	–	–	–	–	–	–	–	–	–	–	–	–	–
Gillett, Brothers	Heanor Common Side	–	–	–	–	–	–	–	–	–	–	–	–	–
Glendon Iron Company, Ilkeston	Mapperley	–	–	1	–	–	–	–	–	–	–	–	–	1
Gosling & Co., Barlboro	Barlboro	–	–	–	–	–	–	–	–	–	–	–	–	–
Gregory and Sharratt, Chesterfield	Reservoir	–	–	–	–	–	–	–	–	–	–	–	–	–
Granville Colliery Company, Burton-on-Trent	Granville	–	–	–	–	–	–	–	–	–	–	–	–	–
Hall, L. and E., New Mills, Stockport	Beard and Bugsworth	–	–	–	–	–	–	–	–	–	–	–	–	–
	Burn'd Edge, Nos. 1, 2	–	–	–	–	–	–	–	–	–	–	–	–	–
	Shale Cross	–	–	–	–	–	–	–	–	–	–	–	–	–
Haslam, W. C.	Pentrich	–	–	–	–	–	–	–	–	–	–	–	–	–
Hardwick Coal Company, Chesterfield	Holmwood	–	–	–	–	–	–	–	–	–	–	1	–	1
Hastings, Charles F., Abney	Blackfordby	–	–	–	–	–	–	–	–	–	–	–	–	–
Hayes, Thomas, and Company	Old Brampton	–	–	–	–	–	–	–	–	–	–	–	–	–
Hall and Boardman, Burton-on-Trent	Cadley Hill, Nos. 1, 2	–	1	–	–	–	–	–	1	–	–	–	–	2
	Gresley Wood	–	–	–	–	–	–	–	–	–	–	–	–	–
	Swadlincote, Nos. 1, 2, and 3	–	–	1	–	–	–	–	–	–	–	–	–	1
Havenhand and Allen, Dronfield	Apperknowl	–	–	–	–	–	–	–	–	–	–	–	–	–
Heanor and Marlpool Colliery Company	Church	–	–	–	–	–	–	–	–	1	–	–	–	1
Hundall Colliery Company	Hundall	–	–	–	–	–	–	–	–	–	–	–	–	–
Hewitt, John Linby, Unstone, Sheffield	Bull Close, Nos. 1, 2	–	–	–	–	–	–	–	–	–	–	–	–	–
Holdsworth, Thomas	Alma	–	–	–	–	–	–	–	–	–	–	–	–	–
Holdsworth and Company, Chesterfield	Pilsley, No. 1	–	–	–	–	–	–	–	–	1	–	–	–	1
	Pilsley, Nos. 3, 2	–	–	–	–	–	–	–	–	–	–	–	–	–
Holford, W. D., Old Whittington	Hill House	–	1	–	–	–	–	–	–	–	–	–	–	1
Huacknll Hutl waite Company, Alfreton	Hucknall Huthwiate	–	–	–	–	–	–	–	–	–	–	–	–	–

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Hutchinson and Saxon	Unstone	–	–	–	–	–	–	–	–	–	–	–	–	–
Hobson, M.	Ilkeston	–	–	–	–	–	–	–	–	–	–	–	–	–
Ilkeston Colliery Company	Oakwell	1	1	1	–	–	–	–	–	–	–	1	–	4
Industrial Coal Company	Hasland	–	–	–	–	–	–	–	–	–	–	–	–	–
	Storforth Lane	–	–	–	–	–	–	–	–	–	–	–	–	–
Jeffcock and Dunn, Sheffield	Birley Railway	–	1	2	–	4	1	–	–	–	3	–	–	11
	„ North	–	–	–	1	–	–	–	–	–	1	–	1	3
	„ Parkgate	–	–	–	–	–	–	–	–	–	–	–	–	–
Jowitt, J., Stockport	Chisworth	–	–	–	–	–	–	–	–	–	–	–	–	–
	Mellor	–	1	–	–	–	–	–	–	–	–	–	–	1
Jowitt and Clayton	Simmondsley	–	–	–	–	–	–	–	–	–	–	–	–	–
Knowles, Wright, and Knowles	New Brampton	–	–	–	–	–	–	–	–	–	–	–	–	–
Knowles and Company, Whittington, Chesterfield	Forge Colliery	–	–	–	–	–	–	–	–	–	–	–	–	–
Kirby and Cross, Clay Cross, Chesterfield	Newmarket	–	–	–	–	–	–	–	–	–	–	–	–	–
Lancaster and Knowles	Highfield	–	–	–	–	–	–	–	–	–	–	–	–	–
Lowe, W. D., Denby	Denby	–	–	–	–	–	–	–	–	–	–	1	–	1
	Salterwood (New)	–	–	–	–	–	–	–	–	–	–	–	–	–
Lucas, Messrs.	Highfield	–	–	–	–	–	–	–	–	–	–	–	–	–
Manor Silkstone, Dronfield, Sheffield	Manor	–	–	–	–	–	–	–	–	–	–	–	–	–
Marehay Colliery Company	Morley Park	–	–	–	–	–	–	–	–	–	–	–	–	–
Manners Colliery Company, Ilkeston	Manners	–	–	–	–	–	–	–	–	–	–	–	–	–
Monkwood Colliery Company	Monkwood (Old)	–	–	–	–	1	–	–	–	–	–	1	–	2
	Barlow Lees	–	–	–	–	–	–	–	–	–	–	–	–	–
Moorwood, C. R. P., Alfreton	Swanwick (Deep)	–	–	–	–	–	–	–	–	–	–	1	–	1
	Ditto (Old)	–	–	–	–	–	–	–	–	–	–	–	–	–
Mundy, Alfred M., Derby	Shipley	–	–	–	–	–	–	–	–	–	–	–	–	–
	Woodside	–	–	–	–	–	–	–	–	–	–	–	–	–
	Nutbrook	–	–	–	–	–	–	–	–	–	–	–	–	–
	Coppice	–	–	–	–	–	–	–	–	–	–	–	–	–
North Wingfield	North Wingfield	–	–	–	–	–	–	–	–	–	–	–	1	1
New Hucknall Colliery Company	Sinking	–	–	–	–	–	–	–	–	–	1	–	–	1
Nadin, Messrs. J. and N., Burton-on-Trent	Woodfield	1	–	–	–	–	–	–	–	–	–	–	–	1
	Main	–	–	–	–	–	–	–	–	–	–	–	–	–
	Stanhope	–	–	–	2	–	–	–	–	–	–	–	–	2
	Eureka	–	–	–	–	–	–	–	–	–	–	–	–	–
Naylor, Henry, Chesterfield	Brockwell Road	–	–	–	–	–	–	–	–	–	–	–	–	–
	Newbold Lane	–	–	–	–	–	–	–	–	–	–	–	–	–
Newdigate, Lieut.-Col., Derby	West Hallam, Nos. 2 & 3	–	–	–	–	–	–	–	–	–	–	–	–	–
Nichols, William, Chesterfield	Riber	–	–	–	–	–	–	–	–	–	–	–	–	–
North Derbyshire Brick-works, Hayfield, Stockport	Mill Brow	–	–	–	–	–	–	–	–	–	–	–	–	–
Northfield Colliery Company, Chesterfield	Northfield	–	–	–	–	–	–	–	–	–	–	–	–	–
Oakes, I., and Company, Alfreton	Pollington	1	–	1	–	–	–	–	–	–	–	–	–	2
	Selstone	–	–	–	–	–	–	–	–	–	–	–	–	–
	Coates Park	–	1	2	–	–	–	2	1	–	–	–	2	8
	Stonyford	–	–	–	1	–	–	–	–	1	1	–	1	4
	Ridding, Nos. 1 & 2	–	–	1	–	–	–	1	–	–	1	–	–	3
	Tunnel	–	–	1	1	1	–	–	–	1	–	–	–	4
	New Silkstone	–	–	–	–	1	1	–	–	1	1	1	–	5
	Ironstone, Nos. 1, 2, & 3	–	–	–	–	–	–	–	–	–	–	–	–	–
Oldfield and Company, Chesterfield	Cutholme	–	–	–	–	–	–	–	–	–	–	–	–	–
Orwin, George, Newbold, Chesterfield	Old Dunston	–	–	–	–	–	–	–	–	–	–	–	–	–

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Pearson, Theophilus, Chesterfield	Highfield	–	–	–	–	–	–	–	–	–	–	–	–	–
Pearson, George, and Company, Alfreton	Oakerthorpe	–	–	–	–	–	–	–	–	1	–	–	1	2
Plevins, C. H., and Company, Newbold, Chesterfield	Blackshale	–	–	–	–	–	–	–	–	–	–	–	–	–
	Potters	–	–	–	–	–	–	–	–	–	–	–	–	–
Proctor, William, Stockport	Fernilee	–	–	–	–	–	–	–	–	–	–	–	–	–
Rangeley, Henry, and Son, Unstone, Sheffield	Drift	–	–	–	–	–	–	–	–	–	–	–	1	1
Renishaw Coal and Iron Company, Chesterfield	Cottam (Old)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ditto (New)	–	–	–	–	–	–	–	–	–	–	–	–	–
Rhodes, Brothers	Troway	–	–	–	–	–	–	–	–	–	–	–	–	–
Rhodes, James, and Son	Coal Aston	–	–	–	–	–	–	–	–	–	–	–	–	–
	Summerley	2	1	1	1	2	–	–	–	1	2	–	1	11
Rhodes, John	Plumbley (Old)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ditto (New)	–	–	–	–	–	–	–	–	–	–	–	–	–
Richardson and Vardy	White Lane	–	–	–	–	–	–	–	–	–	–	–	–	–
Rutland Coal Company, Ilkeston	Rutland, Nos. 2, 4	–	–	–	–	–	–	–	–	–	–	–	–	–
Sheard, John, Dronfield	Gomersal	–	–	–	–	–	–	–	–	–	–	–	–	–
Seely, Charles, and Company, Alfreton	Berrister Lane	–	–	–	–	–	–	–	–	–	–	–	–	–
	Tibshelf, Nos. 1, 2	–	–	–	–	–	–	–	–	–	–	1	–	1
	Shady	–	–	–	–	–	–	–	–	–	–	–	–	–
	Birchwood	–	–	–	–	–	–	–	–	–	–	–	–	–
Sheepbridge Coal and Iron Company, Chesterfield	Norwood	–	1	–	–	–	–	–	–	–	1	–	–	2
	Sheepbridge	1	–	–	–	–	–	–	–	–	1	–	–	2
	Dunston	–	–	–	–	–	–	–	1	–	–	2	–	3
	Nesfield	–	–	–	1	–	–	–	–	–	–	–	1	2
	Langwith	–	–	–	–	–	–	–	–	–	–	–	–	–
	Barlow	–	–	–	–	–	–	–	–	–	–	–	–	–
Shirland Colliery Company, Alfreton	Shirland, Nos. 1 and 2	–	–	–	–	–	–	–	–	–	1	–	–	1
Shirtcliffe, John	Killamarsh	–	–	–	–	–	–	–	–	–	–	–	–	–
Small and Company, South Normanton, Alfreton	Hill Top, Winks Bank	–	–	–	–	–	–	–	–	1	–	–	–	1
Small, G. and T., Kilburne, Derby	Kilburne	–	–	–	–	–	–	–	1	–	–	–	–	1
	Stanley	–	–	–	–	–	–	–	–	–	–	–	–	–
Stanton Iron Company, Nottingham	Dale	–	–	–	–	–	–	–	–	–	–	–	–	–
	Babbington Ironstone	–	–	–	–	–	–	–	–	–	–	–	–	–
	Pleasley	–	–	–	–	–	–	–	–	–	–	–	–	–
Stanley Colliery Company, Limited, Derby	Stanley	–	–	–	–	–	1	–	–	–	–	–	–	1
Staveley Coal and Iron Company, Chesterfield	Campbell	–	–	–	–	–	–	–	–	–	–	1	–	1
	Hollingwood (Old)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ditto (New)	–	–	1	–	–	–	–	–	–	–	1	–	2
	Seymour	–	–	1	–	–	–	–	–	–	–	–	1	2
	Speedwell	–	–	–	–	–	–	–	–	–	–	–	–	–
	Springwell	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ditto Ironstone	–	–	–	–	–	–	–	–	–	–	–	–	–
	Barlborough	–	–	–	–	–	–	–	–	–	–	1	–	1
Shirecoaks Colliery Company	Southgate	–	–	–	–	–	–	–	–	–	–	–	–	–
Shorthouse and Gregory	Peacock	–	1	–	–	–	–	–	–	–	–	–	–	1
Tapton Coal Company, Limited, Chesterfield	Wallsend	–	–	–	–	–	–	–	–	–	–	–	–	–
	Locoford	–	–	–	–	–	–	–	–	–	–	–	–	–
Temple Normanton	Temple Normanton	–	–	–	–	–	–	–	–	–	–	–	–	–
Tymm, J. and N.	Marple	–	–	–	–	–	–	–	–	–	–	–	–	–
Tyler and Woodward	Clay Cross	–	–	–	–	–	–	–	–	–	–	–	–	–
Temple Normanton Colliery Co.	–	–	–	–	–	–	–	1	1	–	–	1	–	3
Unstone Coal and Coke Company, Limited, Chesterfield	Unstone	2	–	–	–	1	–	–	1	–	2	1	1	8
Wells, Joseph and George, Eckington, Chesterfield	Renishaw Park, Nos. 1, 2	–	–	–	–	–	–	1	–	–	1	–	–	2
	„ Nos. 3 and 4	–	–	–	–	–	–	–	–	–	–	–	–	–
	Hornthorpe	–	–	2	–	–	–	–	–	1	–	–	–	3
	Park Gate	–	–	–	–	–	–	–	–	–	–	–	–	–
	Prince Albert	–	–	–	–	–	–	–	–	–	–	–	–	–
	Mosbro Moor	–	–	–	–	–	–	–	–	–	–	–	–	–
	High Lane	–	–	–	–	–	–	–	–	–	–	–	–	–
	Holbrook	–	–	–	–	–	–	–	–	–	–	–	–	–

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
West, H. H., Heanor, Langley Mill	New Heanor	–	–	–	–	–	–	–	–	–	–	–	–	–
Whittington Coal Company, Chesterfield	Foxley Oaks	–	–	–	–	–	–	–	1	–	–	–	1	2
Whittington and Sheepbridge Coal Company	Broom Field	–	–	–	–	–	–	–	–	–	–	–	–	–
Whitehouse and Son	West Hallam, Nos. 1 and 2	–	–	–	–	1	–	–	–	–	–	–	–	1
	Kirb. Hallam	–	–	–	–	–	–	–	–	–	–	–	–	–
Wharmby William	Hague Bridge	–	–	–	–	–	–	–	–	–	–	–	–	–
White, George, Dronfield	Rough Piece	–	–	–	–	–	–	–	–	–	–	–	–	–
Wingerworth Coal Company, Chesterfield	Avenue	–	–	–	–	–	–	–	–	–	–	–	–	–
	Williamthorpe	–	–	–	–	–	–	–	–	–	–	–	–	–
	Lings	1	–	–	1	–	–	–	–	–	–	–	–	2
Woodville Fire Brick Company	Clay Pits	–	–	–	–	–	–	–	–	–	–	–	–	–
Woodward, James, Swadlincote	Ditto	–	–	–	–	–	–	–	–	–	–	–	–	–

NOTTINGHAMSHIRE.

Annesley Coal Company	Annesley, Nos. 1 and 2	1	–	–	–	–	2	–	–	1	–	–	–	4
Awsworth Iron and Coal Company, Ilkeston	Furnace	–	–	–	–	–	–	–	–	–	–	–	–	–
	Blackshale	–	–	–	–	–	–	–	1	–	–	–	–	1
	Piper	–	–	–	–	–	–	–	–	–	–	–	–	–
Barber, Walker, and Company, Eastwood	Brinsley	–	1	1	–	–	–	–	–	–	–	–	–	2
	Cotmanhay	–	–	–	–	1	–	–	–	–	–	–	–	1
	Eastwood	–	1	–	–	–	–	–	1	–	1	–	–	3
	High Park	1	–	–	2	–	–	–	1	–	–	–	–	4
	Moor Green	2	1	2	–	–	–	–	–	–	1	1	–	7
	Underwood	–	–	–	–	–	–	–	–	–	–	–	–	–
	Watnall (Old)	–	–	–	–	–	1	–	–	–	–	–	1	2
	Watnall (New)	–	–	–	1	–	–	–	–	–	–	–	–	1
Beardsley, John, Eastwood	Brinsley	–	–	–	–	–	–	–	–	–	1	–	–	1
Bestwood Coal Company (Sinking)	Bestwood, Nos. 1 and 2	–	–	–	–	–	–	2	2	–	1	–	–	5
Butterley Iron and Coal Company	Portland, Nos. 1, 2	–	–	–	–	–	–	–	–	–	–	–	–	–
	,, Nos. 4 and 6	–	–	–	–	–	–	–	–	–	–	–	–	–
	Mexbro' (North)	–	–	–	–	–	–	–	–	–	–	–	–	–
	,, (South)	–	–	–	–	–	–	–	–	–	–	–	–	–
	,, (Bottom)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Plumptre	–	–	1	–	–	–	–	–	–	1	–	–	2
Bradbury, John	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Clifton Colliery Company	Clifton (Hard)	1	1	–	–	1	1	1	–	–	1	–	–	6
	,, (Soft)	1	–	–	2	1	–	–	1	1	2	–	1	9
Digby Coal Company, Eastwood	New London	–	–	1	–	–	–	–	–	–	–	–	–	1
	Speedwell	–	–	–	–	–	–	–	–	–	–	–	–	–
	Newthorpe (Hard)	–	–	–	–	–	–	–	–	–	–	–	–	–
	,, (Soft)	–	–	–	–	–	–	–	–	–	–	–	–	–
	Digby	–	–	–	–	–	–	–	–	–	–	–	–	–
Ellis and Company, Nottingham	Hucknall, No. 1	–	–	–	–	–	–	–	–	–	–	1	–	1
	,, No. 2	–	–	–	–	–	–	–	–	–	–	–	–	–
Hall, William	Lodge	–	–	–	–	–	–	–	–	–	–	–	–	–
Knighton and Smith, Eastwood	Springfield	–	–	–	–	–	–	–	–	–	–	–	–	–
Linby Coal Company, Nottingham	Linby	–	–	–	–	–	–	–	–	1	–	–	–	1
Lynch and Cadogan, Cossall, Nottingham	Cossall	–	–	–	–	–	1	–	–	–	–	–	–	1

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Mellors, Nathan	Molyneux	–	–	–	–	–	–	–	–	–	–	–	–	–
Newstead Colliery Company	Newstead	–	–	–	–	1	–	–	–	–	2	–	–	3
New and Oldknow, Nottingham	Wollaton	1	–	–	–	–	–	2	1	–	–	–	–	4
New Hucknall Colliery Co.	New Hucknall	–	–	–	–	–	–	–	–	–	–	–	–	–
Seeley, Charles, and Company, Nottingham	Bulwell	–	–	–	–	–	–	–	–	–	–	–	–	–
	Cinder Hill, Nos. 1 and 4	–	1	–	–	–	1	–	–	–	1	–	1	4
	Kimberley, Nos. 1 and 2	–	–	–	–	–	–	–	–	–	–	–	–	–
	Newcastle	–	–	–	–	–	–	–	–	–	–	–	–	–
Skegby Coal and Lime Company	Skegby	–	–	–	–	–	–	–	–	–	–	–	–	–
	Brierley Hill	–	–	–	–	–	–	–	–	–	–	–	–	–
Stanton Iron and Coal Company	Teversall, Nos. 1 and 2	–	1	1	–	1	1	1	1	–	1	–	1	8
	Pleasley	–	–	–	–	–	–	–	–	–	1	–	–	1
	Silver Hill	–	–	–	–	–	–	–	–	–	–	–	–	–
Shireoaks Colliery Company	Shireoaks, Nos. 1 and 2	–	–	–	–	1	–	1	1	–	–	–	1	4
	Steetley Wood	–	–	–	–	–	–	–	–	–	–	–	–	–
Stapleford Colliery Company	Stapleford	–	–	–	–	–	–	–	–	–	–	–	–	–

WARWICKSHIRE.

Amington Colliery Company, Tamworth	Amington	–	–	–	–	–	–	–	–	–	–	–	–	–
	Glascote	–	–	–	–	–	–	–	–	–	–	–	–	–
Ansley Hall Colliery Company, Atherstone	Ansley, Nos. 1, 2, and 3	–	1	–	–	–	–	–	–	–	–	–	1	2
Bedworth Coal and Iron Company, Bedworth	Woodlands	–	–	1	–	–	–	2	–	1	–	–	1	5
	Ironstone, Nos. 1, 2, 3, and 4	–	–	–	–	–	–	–	–	–	–	–	–	–
Dugdale, W., Atherstone	Baddesley	–	–	–	–	–	–	–	–	–	–	–	–	–
Dumolo, T., Tamworth	Kettlebrook	–	–	–	1	–	–	–	–	–	–	1	–	2
Gibbs and Canning, Wilnecote, Tamworth	Wilnecote, Nos. 1 and 2	–	–	–	–	–	–	–	–	–	–	–	–	–
Hawkesbury Colliery Company, Coventry	Hawkesbury	–	–	–	–	–	–	–	–	–	–	–	–	–
	Speedwell	–	–	–	–	–	–	–	–	–	–	–	–	–
	New Winnings	–	–	–	–	1	–	–	–	–	–	–	–	1
Harris, J. and W. S., Coventry	Craven	–	–	–	–	–	–	1	–	–	–	–	–	1
Hockley Hall Colliery Company, Tamworth	Whiteley	–	–	1	–	–	–	1	–	–	–	–	–	2
	Hockley Hall	–	–	–	–	–	–	–	–	–	–	–	–	–
	„ Nos. 2, 3, and 4	–	–	–	–	–	–	–	–	1	–	–	–	1
	Four Foot	–	–	–	–	–	–	–	–	–	–	–	–	–
	Ironstone	–	–	–	–	–	–	–	–	–	–	–	–	–
Marshall, C., Alvecote, Tamworth	Alvecote	–	–	–	–	–	1	–	–	–	–	–	1	2
Morgan, Davis, and Company, Wilnecote, Tamworth	Dost Hill	–	–	–	–	–	–	–	–	–	–	–	–	–
Morris and Shaw, Tamworth	Birch Coppice	–	–	–	–	–	–	–	2	–	1	–	–	3
	Hall End	–	–	–	–	–	–	–	–	–	1	–	–	1
Newdegate, Charles, M.P., Nuneaton	Griff, Nos. 1, 2	–	1	1	–	–	–	–	–	–	–	–	–	2
	„ Nos. 3 and 4	–	–	–	–	–	–	–	–	–	–	–	–	–
Nowell and Son, Nuneaton	Haunch Wood	1	–	–	–	–	–	–	–	–	–	–	–	1
	Tunnel	–	–	–	–	–	–	–	–	–	–	–	–	–
Perrins and Harrison, Wilnecote, Tamworth	Wilnecote	–	–	–	–	–	–	–	–	–	–	–	–	–
Pooley Hall Colliery Company, Limited	Pooley Hall	–	–	–	–	–	–	–	1	1	–	–	–	2

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Skey and Company, Wilnecote, Tamworth	Tame Valley	–	–	–	–	–	–	–	1	–	–	–	1	2
	Peel	–	–	–	–	–	–	–	–	–	–	–	–	–
	New Pit	–	–	–	–	–	–	–	–	–	–	–	–	–
Smallman and Company, Nuneaton	Harts Hill	–	–	–	–	–	–	–	–	–	–	1	1	2
Stanley, Brothers, Nuneaton	Swann Lane	–	–	–	–	–	–	–	–	–	–	–	–	–
	Nuneaton	–	1	–	–	–	–	–	–	–	–	–	–	1
Wilson, E., Bedworth	Exhall	–	–	–	–	–	–	–	–	–	–	–	–	–
Wykin Coal Company, Coventry	Walsgrove	1	–	–	–	–	1	2	–	–	–	–	–	4
	Ironstone, Nos. 1, 2, & 3	–	–	–	–	–	–	–	–	–	–	–	–	–

LEICESTERSHIRE.

Appleby Magna Colliery Company, Snareston	Appleby Magna	–	–	–	–	–	–	–	–	–	–	–	–	–
Baker, J. W., Heather, Coalville	Heather	–	–	–	–	–	–	–	–	–	1	–	–	1
Bagworth Coal Company, Bagworth	Bagworth, Nos. 1 and 2	1	–	–	–	–	–	–	–	–	1	–	–	2
Boothorpe Brick and Coal Company	Boothorpe	–	–	–	–	–	–	–	–	–	–	–	–	–
Checkland, Son, and Williams, Ashby-de-la-Zouch	Donisthorpe	1	–	1	–	–	–	–	2	–	–	–	1	5
Checkland and Co.	Colcorton	–	–	–	–	1	2	–	–	–	–	–	–	3
Ellis, Joseph J.	Ellistown	–	–	–	–	–	–	–	–	1	–	–	2	3
Ensor, Edward	Clay Pits	–	–	–	–	–	–	–	–	–	–	–	–	–
Green, Thomas, Swadlincote	Potsherd, Nos. 1 and 2	–	–	–	–	–	–	–	–	–	–	–	–	–
Hastings, Charles Frederick Abney, Moira, Ashby-de-la-Zouch	Reservoir	–	1	–	–	–	–	–	–	–	–	–	1	2
	Moira	–	–	–	–	–	–	–	–	–	–	–	–	–
	Church Gresley	1	1	–	–	–	1	1	–	–	–	3	–	7
	Oakthorpe	–	–	–	–	–	–	–	1	–	–	–	–	1
	Rawdon	–	–	–	–	–	–	–	–	–	–	–	–	–
	Blackfordby	–	–	–	–	–	–	–	–	–	–	–	–	–
Heather Colliery Company	Heather	–	–	–	–	–	–	–	–	–	–	–	–	–
Ibstock Coal Company, Coalville, Leicester	Ibstock, Nos. 1 and 2	–	–	–	–	–	–	–	–	–	–	–	–	–
Knowles & Co.	Wooden Box	–	–	–	–	–	–	–	–	–	–	–	–	–
Lancaster, John, and Company, Ashby-de-la-Zouch	Heath End	–	–	–	1	–	–	–	–	–	–	–	1	2
Lindridge Coal Company	Lindridge	–	–	–	–	–	–	–	–	–	–	–	–	–
Netherseal Colliery Company	Netherseal	–	–	–	–	–	–	–	–	–	–	–	–	–
Perry, Captain, Boothorpe	Plough Flats	–	–	–	–	–	–	–	–	–	–	–	–	–
Smart, Joseph and Son, Griffy dam, Ashby-de-la-Zouch	Griffy dam	–	–	–	–	–	–	–	–	–	–	–	–	–
Stephenson, G. R., and Company, Coalville	Snibston, No. 1	–	–	1	–	–	–	–	–	–	1	–	1	3
	,, No. 2	1	1	–	1	–	–	–	–	–	–	–	–	3
	,, No. 3	–	–	–	–	–	–	–	–	–	–	–	–	–
South Leicestershire	–	–	–	1	1	1	–	–	–	–	–	–	–	3

Owner or Company and Postal Address.	Name of Mine or Colliery.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Thornton, Joseph	Nailstone	–	1	–	–	–	–	–	–	–	–	–	–	1
Thompson, Brothers, Woodville	Clay Pits	–	–	–	–	–	–	–	–	–	–	–	–	–
Whitwick Colliery Company, Coalville	Whitwick	1	–	–	–	–	1	–	–	–	–	–	–	2
	„ Nos. 3, 4, 5, and 6	–	–	–	–	–	–	1	–	–	–	–	–	1
	Coleorton	–	–	–	–	–	–	–	–	–	–	–	–	–

SUMMARY of NON-FATAL ACCIDENTS reported under the Coal Mines Regulation Act during the Year 1878.

County.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Derbyshire	17	16	20	16	19	5	9	9	11	26	22	20	190
Nottinghamshire	7	6	6	5	6	7	7	9	3	13	2	5	76
Warwickshire	2	3	3	1	1	2	6	4	3	2	2	5	34
Leicestershire	5	4	3	3	3	4	1	3	1	3	3	6	39
	31	29	32	25	29	18	23	25	18	44	29	36	339

LIST of UNDERGROUND COLLIERY EXPLOSIONS in the MIDLAND DISTRICT during the Year 1878.

Date.	Name and Situation of the Colliery.	No. of Persons Injured.		Height of Barometer at time of the explosion reduced to sea level.	Remarks.
		Non-Fatal.	Fatal.		
1878.	Ellistown, Leicester	2	—	29·72 R	Heavy fall of roof. Man went to examine it with a naked light, although he had a safety lamp in the stall.
	Unstone	1	—	30·25 R	Deputy took off his lamp top to examine a setting of timber. Pit worked with locked safety lamps.
	Kilburne	1	—	30·00 R	Heading inadequately ventilated.
	Cloddy Pit, Riddings, Alfreton	2	—	30·00 F	Exploring an old heading with a naked light.
	Rangeleys Drift, Unstone	3	—	30·45 R	Deputy neglected to carefully examine the stall before the men went to work.
	Whittington and Sheepbridge	2	—	29·60 F	Men went to work before the place had been examined by the deputy.
	Temple Normanton, Chesterfield	1	—	30·00 R	Setting timber near a heavy fall of roof which had impeded the ventilation.
	No. 7 Clay Cross	1	—	29·95 S	Stall on the weight. Stallman, after withdrawing his men, went to examine the place with a naked light.
	Donisthorpe	1	—	30·05 S	Heading inadequately ventilated.
	Blackwell, A.	1	—	30·05 S	Loaded tub, in passing under a brattice-cloth, tore it down, and the man neglected to put it up again.
	Birley (West Pit)	1	—	29·75 R	Brattice-cloth disarranged, and part of the ventilation cut off.
	Clifton (soft coal)	1	—	29·90 F	Gas ignited in a break in the roof. Explosion very slight.
	Campbell, Staveley	—	—	—	No one burnt.

Date.	Name and Situation of the Colliery.	No. of Persons Injured.		Height of Barometer at time of the explosion reduced to sea level.	Remarks.
		Non-Fatal.	Fatal.		
	Bagworth	1	—	29·50 R	Stall insufficiently examined, or probably the gas would have been found.
	Swanwick (Deep Pit)	1	—	30·05 S	Stallman, looking for a wedge, placed his candle near a break in the roof.
	No. 3 Clay Cross	—	—	30·10 R	No one burnt.
	Riddings Silkstone, Alfreton	1	—	30·10 R	Went out of his working place to another heading that had not been examined.
	Newcastle, Cinder Hill, Nottingham	1	—	29·23 F	Fall of roof had disarranged the brattice and diverted the air current.
	Pollington Riddings, Alfreton	1	—	30·30 F	Insufficient air passing along the road-way, being tightly confined to the working stalls which were well ventilated.
	Britain Butterley	1	—	30·15 S	Stallman taking his light back into the goaf.
	No. 2 Clay Cross	2	—	29·85 F	Supposed to have put a naked light into a hole in the roof.
	Total deaths by explosions	—	—		
	Total injured by explosions	25	—		
	ABOVE GROUND.				
	Cadley Hill	3	—	—	Examining pipes from gasholder on the surface, when an explosion of gas occurred, injuring three persons.

NOTE.—R indicates rising; S steady; and F falling Barometer.
9 explosions of gas—Rising barometer.
5 „ „ Steady „
6 „ „ Falling „

LIST of GUNPOWDER EXPLOSIONS in the MIDLAND DISTRICT during the Year 1878.

Date.	Name and Situation of the Colliery.	No. of Persons Injured.		Remarks.
		Non-Fatal.	Fatal.	
1878.				
Jan. 5	Morley Park, Belper	1	—	Took powder in a tin can and, mistaking it for his tea-bottle, placed it on the fire.
„ 28	Pollington, Langley Mill	1	—	Shot missed fire. Went to look at the fuze when it exploded.
Mar. 12	No. 2 Clay Cross	1	—	Went back to see if the fuze was burning when the shot went off.
„ 27	New Watnall, Eastwood	2	—	Lighted lamp fell upon the powder-can whilst the men were taking out a charge of powder.
Apr. 24	Whitwick, Coalville	1	—	Cut the fuze too short, and shot exploded before he was clear away.
„ 30	No. 2 Snibston, Coalville	1	—	Took his powder in a blacksmith's shop, and a spark from the anvil fired it.
June 21	Temple Normanton, Chesterfield	1	—	Fired the cartridge with his candle whilst adjusting the fuze.
July 26	Low Main Riddings, Alfreton	2	—	Supposed to have fired the powder with his candle at the mouth of the shot-hole.
Sept. 4	Kettlebrook, Tamworth	1	—	Taking powder out of the can with a naked light in his hand.
Oct. 3	New Watnall, Eastwood	1	—	Holding the powder in his hand near a lamp when a spark fell and ignited it.
„ 14	Plumptree, Butterley Company	1	—	Shot hung fire, and when the coals were being taken down it exploded.

Date.	Name and Situation of the Colliery.	No. of Persons Injured. Non-Fatal.	No. of Persons Injured. Fatal.	Remarks.
Oct. 26	Lings Wingerworth, Chesterfield -	3	—	Lighted candle fell from the coal face on to the cartridge in the man's hand.
Nov. 19	No. 7 Clay Cross - - -	1	—	Lighted the "Jarmin" with a candle instead of using "touch-paper" or fuze.
„ 29	Ellistown, Leicester - -	1	—	Igniting touch-paper when the shot suddenly exploded.
	Total deaths by gunpowder -	—	—	
	Total injured by gunpowder -	17	—	
	BOILER EXPLOSION.			
Oct. 15	Birch Coppice, Tamworth - -	—	—	Fractured plate. All the water ran out. Boiler lifted out of its seating. No one injured.

LIST of MINES abandoned and Plans sent to the Secretary of State, showing the workings of the Mine up to the time of abandonment.

(Section 42, Mines Act, 1872.)

Name of Owner.	Name of Mine or Colliery.	Where situated.	Name of Seam.	Date of Abandonment.
Appleby and Co. - -	Whittington -	Chesterfield -	Silkstone Ironstone.	April 4, 1876.
Bainbridge and Partners -	Hundall - -	Ditto -	Silkstone -	Dec. 21, 1874.
Barnes Brothers - -	Grassmoor - -	Ditto -	Top Hard -	Jan. 28, 1875.
Barnes Brothers - -	Ditto - -	Ditto -	Waterloo -	Sept. 5, 1876.
Barber, Walker, and Co.	Underwood -	Eastwood -	Top Hard -	May 17, 1876.
	Willey Lane -	Ditto - -	Ditto -	Ditto.
	Eastwood - -	Ditto - -	Searching for Kilburne.	
Bedworth Iron and Coal Company.	Bedworth - -	Coventry - -	Black and Blue Flats Ironstone.	June 27, 1877.
Belper Laund - -	Belper Laund -	Belper - -	Naughton.	
Benton and Woodiwiss -	Shirland - -	Alfreton - -	Furnace -	June 1, 1877.
Bennett, Thomas -	Shawmarsh - -	Glossop -	Mountain -	Jan. 22, 1876.
	Birch Vale -	New Mills -	Yard - -	Feb. 1, 1876.
Bingham, Richard - -	Mickley - -	Dronfield -	Mickley -	Dec. 31, 1877.
Birch and Ryde - -	Chellaston - -	Chellaston -	Gypsum -	Dec. 14, 1878.
Bircumshaw, I. H. - -	Newmarket - -	Clay Cross -	Silkstone -	April 12, 1878.
	Alma - -	„ -	Cannel - -	Ditto.
Boam, Henry - -	Dunstead - -	Langley Mill -	Top Hard -	Jan. 29, 1876.
Booth, William -	Langley Mill -	Ditto - -	Comb - -	Dec. 20, 1875.
Bramhall, E. - -	Birley Moor -	Sheffield - -	Deep Hard -	May 18, 1878.
Brocklehurst, H. S. - -	New Brampton -	Chesterfield -	- - -	April 22, 1878.
Boundy, Charles - -	Pentrich - -	Ripley - -	- - -	March 1878.
Buchanan, N., and Son -	Brushes - -	Ditto -	Deep Hard -	Aug. 7, 1876.
Butterley Iron and Coal Company - -	Marehay - -	Ripley - -	Ironstone -	March 23, 1875.
	Ormonde - -	Ditto - -	Black Ironstone	March 14, 1876.
	Ditto - -	Ditto - -	Brown Ironstone.	Ditto.
	Nos. 1 & 2 Butterley Park and 40 Horse and Western.	Butterley - -	Black and Brown Ironstone and Ell Coal.	
	Denby - -	Ditto - -	Black and Brown Ironstone.	June 10, 1876.
	Brickyard, Whitely, Cally.	Butterley - -	Black Rake Ironstone and Ell Coal.	
	Ilkeston - -	Ilkeston -	Ditto.	March 15, 1878.
Church and Maples - -	Swadlincote -	Burton-on-Trent	Block - -	March 5, 1875.
Chesterfield and Boythorpe	Boythorpe - -	Chesterfield -	Deep Hard -	May, 1877.
	„ No. 2 -	„ -	Tupton - -	April 10,

Name of Owner.	Name of Mine or Colliery.	Where situated.	Name of Seam.	Date of Abandonment.
Coke and Co.	Carnfield	Alfreton	Hard and Soft Coal.	April 9, 1877.
Crooks, John	Bridge House	Brampton	Deep Soft.	
	Holme Farm	Brampton	Silkstone.	
Dawes, G. and H.	Salterwood	Denby	Furnace and Two Feet Black Rake Ironstone.	April 19, 1877.
	Ditto	Ditto	Bottom Hard-	Dec. 31, 1877.
Dronfield Brick Company	Hill Top	Dronfield	Silkstone.	
Evans, Richard	Newthorpe Lodge	Ilkeston	Deep Soft	Jan. 8, 1876.
	Grove	„	Ditto	
Ford and Mart	Marehay	Ripley	Ell	Aug. 8, 1877.
Gibbs and Canning	Glasscote	Tamworth	Fireclay	Jan. 26, 1876.
Gibbs and Canning	Ditto	Ditto	Whiteclay	Jan. 24, 1877.
Gill and Co.	Apperknowl	Unstone	Piper	Nov. 9, 1876.
Green, Woodward, and Co.	Newlands	High Hazles	Killamarsh	
Gosling	West Field	Balbro, Eckington	High Hazle	Dec. 31, 1877.
Green, Thomas	Swadlincote	Burton-on-Trent	Fireclay Coal.	
Hayes, Thomas	Old Brampton	Chesterfield	Ashgate	Ditto.
Hastings, L. Abney	Church Gresley	Burton-on-Trent	Little Coal	Feb. 20, 1877.
Havenhand and Allen	Apperknowl	Unstone	Deep Hard	Jan. 22, 1876.
Heanor and Marlpool	Church	Heanor	Comb	April 30, 1875.
Hoskin, Samuel, and Co.	Ashgate	Chesterfield	Silkstone	Feb. 18, 1875.
Hoskin, Samuel, and Co.	Cutthorpe	Ditto	Ditto	May 25, 1877.
Hoskin, Geo.	Somersall	Ditto	Ditto	April 12, 1878.
Hursthouse, Wm.	Holy Moorside	Ditto	Ditto	
Jackson, R. W. and Co.	Old Brampton	Ditto	Ditto	June 14, 1875.
	Alton	Ditto	Alton	Ditto.
Johnson, Geo.	Clay Lane	Clay Cross	Silkstone	Dec. 31, 1877.
Jowitt, J.	Mellor	Marple	Mountain	Sept. 3, 1878.
Kirby, Thos.	Phœnix High Lane	Eckington	Silkstone	
Knight, Ed.	Ox Close	Dronfield	Ditto	
Langley Mill Engineering Company.		Langley Mill	Top Soft	Feb. 8, 1876.
Lowe, Samuel	Whitecotes	Chesterfield	Waterloo	April 12, 1878.
	Wingfield Lane			
Lucas, Samuel	Stubley	Dronfield	Silkstone	May 12, 1877.
Mundy, A. M.	Nutbrook	Ilkeston	Deep Hard	Jan. 8, 1878.
North Wingfield Colliery Company.	North Wingfield	Clay Cross	Waterloo	Dec. 31, 1877.
North Derbyshire Brick Company	Ludworth	Marple	Fireclay	
Oaks and Co.	Selston	Alfreton	Black Rake, Brown Rake, Whetstone Ironstone.	June 5, 1878.
Overseal Coal Company	Overseal	Moira	Moira Main	Jan. 26, 1876.
Oldfield, John	Cutholme	Brampton	Deep Hard	
Part, C. E.	Weston-on-Trent	Near Derby	Gypsum	Nov. 10, 1877.
Pearson, Geo.	Oakerthorpe	Wingfield	Furnace	Sept. 28, 1878.
Plant, John		Birley.		
Rhodes and Son	Coal Aston	Dronfield	Silkstone	June 12, 1875.
Rutland Coal Company	Rutland	Ilkeston	Deep Soft and Roof.	Oct. 7, 1875.
Saxon, Samuel	Woodhouse Lane	Eckington	High Hazles	
Seely, Charles, and Co.	Cotes Park	Alfreton	Deep Soft	Dec. 21, 1875.
Ditto	Birchwood	Ditto	Deep Hard and Soft and Brown Rake Ironstone.	Ditto.
Ditto	Kimberley	Nottingham	Deep Hard	

Name of Owner.	Name of Mine or Colliery.	Where situated.	Name of Seam.	Date of Abandonment.
Senior and Worrall	High Moor	Eckington	High Hazle	Nov. 16, 1877.
Shirtcliff and Son	Comberwood	Killamarsh	Thin Coal	
Shaw, Samuel	Norman	Ilkeston	Deep Soft	Dec. 19, 1878.
Sheepbridge Iron and Coal Company.	Glasshouse	Chesterfield	Silkstone Ironstone.	April 4, 1876.
Skegby Coal Company	Old Skegby	Mansfield	Top Hard	Dec. 22, 1878.
Stanley Brothers	Swann Lane	Nuneaton	Blue Coal	June 6, 1878.
Stanton Iron Company	Silver Hill	Teversall	Dunsil and Top Hard	May 11, 1876.
	Ditto	Mansfield		Ditto.
Stanton Iron Company	Babbington	Eastwood	Ironstone	Dec. 9, 1875.
Stapleford Colliery Company	Stapleford	Nottingham	Kilburne	Nov. 23, 1875.
Steele, Geo.	Glasshouse	Brimington	Silkstone	
Swann, Joseph	Hill Top, Normanton	Alfreton	Top Hard	Oct. 13, 1875.
Swannington Coal Company	Swannington	Leicester	Moira Main	Aug. 13, 1877.
Tapton Coal Company	Tapton	Chesterfield	Silkstone	Nov. 3, 1877.
	Wallsend	Ditto	Ditto	Ditto.
Tugby and Co.	Woodville	Burton-on-Trent	Fireclay	Feb. 14, 1877.
Ward and Ellis	Birdfield	High Lane, Eckington.	Silkstone	
Wells, J. and G.	West Wells	Eckington	Silkstone	
	Prince Albert			
Whitehouse, A. and W.	West Hallam	Ilkeston	Soft Coal	April 28, 1877.
	,, No. 5	Ditto	Deep Hard	
White, Geo.	Rough piece	Dronfield	Silkstone	Oct. 20, 1875.
Whittington and Sheepbridge	Broom House	Chesterfield	Ditto	
Wilson, Edward	Collycroft	Bedworth	Two Yard, Rider, and 7-foot.	April 13, 1876.
Wollaton Colliery Company	Wollaton	Nottingham	Waterloo	March 5, 1875.

SHOWING the DEATHS that have taken place from FALLS of ROOF at the under-mentioned Collieries in the years 1867–78.

Name of Colliery.	Owner's Name.	Deaths.												
		1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total.
Clay Cross	Clay Cross Iron and Coal Co.	3	3	2	4	3	4	1	1	—	3	2	1	27
Staveley	Staveley Iron and Coal Co.	3	3	1	1	3	2	3	1	1	2	2	1	23
High Park, Eastwood, &c.	Barber, Walker, & Co.	—	3	2	—	1	—	3	2	4	5	1	2	23
Butterley	Butterley Iron and Coal Co.	6	1	2	1	3	1	1	1	1	1	—	3	21
Sheepbridge, &c.	Sheepbridge Iron and Coal Co.	—	3	1	1	—	2	—	1	2	1	2	3	16
Cinderhill, &c.	Babbington Coal Co.	2	—	—	1	1	2	—	—	2	4	—	1	13
Riddings	James Oakes & Co.	—	—	2	1	—	1	—	—	1	5	2	—	12
Swannington	Walker and Worswick	—	3	2	1	1	2	—	—	—	1	—	—	10
Bretby and Newhall	Countess of Chesterfield	—	—	1	1	1	2	2	—	2	1	—	—	10
Teversall	Stanton Iron Company	—	—	—	2	1	—	2	3	—	1	2	—	11
Shipley	E. M. Mundy	—	—	3	—	1	1	1	—	—	1	—	—	7
Whitwick	Whitwick Coal Co.	—	1	—	1	4	—	—	—	1	—	1	—	8
Swadlincote	Hall and Boardman	1	—	2	—	1	—	1	—	—	1	—	—	6
Shirland	Shirland Colliery Co.	1	—	—	—	1	2	1	1	—	—	—	—	6
Tibshelf & Birchwood	C. Seely & Co.	—	—	—	—	—	2	—	—	—	4	1	1	8
Renishaw	Boythorpe Colliery Co.	—	—	1	—	—	—	1	1	—	3	—	—	6
Albert	Derbyshire Silkstone Coa. Co.	—	—	—	1	1	1	2	—	—	—	—	1	6
Shireoaks	Shireoaks Colliery Company	—	1	1	—	—	1	1	1	—	—	2	1	8
Moira, &c.	E. Abney Hastings	—	1	1	—	—	1	—	—	—	2	—	1	6
Birley Vale	Jeffcock & Dunn	—	—	1	—	1	1	—	1	1	—	—	1	6
Clifton	Clifton Colliery Co.	—	—	—	—	—	—	2	1	1	1	—	—	5
Renishaw Park	J. & G. Wells, Limited	—	—	1	—	—	1	—	2	—	1	1	1	7
Mapperley	Glendon Iron Company	—	—	—	—	—	—	1	—	2	2	—	—	5
Snibston	G. R. Stevenson & Co.	—	—	—	1	—	2	1	—	—	—	—	—	4
Stanton	E. Nadin & Co.	2	—	—	—	1	1	—	—	—	—	1	1	6
Pinxton	Coke & Co.	1	—	1	—	1	—	—	—	1	—	—	—	4
Hucknall Torkard	E. Ellis & Co.	—	1	1	—	—	—	1	1	—	—	—	1	5
Nailstone	J. Thornton	2	—	—	—	—	—	—	1	1	—	1	—	5
Glascote	Firmstone & Co.	1	—	—	1	1	—	—	—	—	—	—	—	3
Granville	Granville Colliery Co.	—	1	—	—	1	1	—	—	—	—	—	—	3

Name of Colliery.	Owner's Name.	Deaths.												
		1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total.
Hill Top and Berristow	G. Small & Co.	1	—	—	—	—	1	1	—	—	—	—	—	3
Swanwick	C. R. P. Morewood	—	—	—	1	—	—	—	1	1	—	—	—	3
Kilburne	Thomas and George Small	—	—	—	—	—	1	—	1	—	1	1	—	4
Hawkesbury	Jas. Darlington & Co.	—	—	1	—	1	—	—	—	—	—	—	—	2
Denby	W. D. Lowe	—	—	—	—	1	1	—	—	—	—	—	—	2
Charity	Addenbrooke & Co.	—	1	—	—	—	—	1	—	—	—	1	—	3
Brampton	R. W. Jackson	—	—	—	—	—	—	2	—	—	—	—	—	2
Tapton	Tapton Coal Company	—	—	—	—	—	—	2	—	—	—	—	—	2
Pilsley	Holdsworth & Co.	—	—	—	—	—	—	2	—	—	—	1	—	3
Pooley Hall	Pooley Hall Colliery Co.	—	—	—	—	—	1	1	—	—	—	—	—	2
Netherseal	Netherseal Coal Company	—	—	—	—	—	—	1	—	—	1	1	—	3
Newbold	C. H. Plevins	—	1	—	—	1	—	—	—	—	—	—	—	2
Grassmoor	Barnes, Brothers	—	—	1	—	—	—	—	—	1	—	—	1	3
Tame Valley	G. Skey, & Co.	—	—	1	—	—	—	—	—	—	1	—	—	2
Annesley	Annesley Coal Co.	—	—	—	1	—	—	—	—	—	1	—	—	2
Wilnecote	Perrins & Harris	—	—	—	1	—	—	—	—	1	—	—	—	2
Compstall	Andrews and Son	—	—	—	—	—	1	—	—	1	—	—	—	2
Blackwell	Blackwell Coal Co.	—	—	—	—	—	—	—	—	2	—	1	2	5
Birch Coppice	Morris & Shaw	—	—	—	—	—	—	—	—	—	2	1	—	3
Griff	C. N. Newdegate, M.P.	—	—	—	—	—	—	1	—	—	—	—	—	1
Wyken	Wyken Colliery Company	—	—	—	—	—	—	1	—	—	—	—	1	2
Exhall	E. Wilson	—	—	—	—	—	—	1	—	—	—	—	—	1
Thatchmarch	Buxton Lime Company	—	—	—	—	—	—	1	—	—	—	—	—	1
Wingfield Lane	Samuel Lowe	—	—	—	—	—	—	1	—	—	—	—	—	1
Molyneux	Eastwood and Swingler	1	—	—	—	—	—	—	—	—	—	—	—	1
Haunch Wood	Nowell & Son	1	—	—	—	—	—	—	—	—	—	—	—	1
Victoria	— Troughton	—	1	—	—	—	—	—	—	—	—	—	—	1
Dronfield	Wm. Booker	—	1	—	—	—	—	—	—	—	—	—	—	1
Birch Vale	Bennett & Son	—	—	1	—	—	—	—	—	—	—	—	—	1
Whittington	Whittington Colliery Company	—	—	1	—	—	—	—	—	—	—	—	—	1
Old Swadlincote	Church and Maples	—	—	—	1	—	—	—	—	—	—	—	—	1
Tibshelf	E. Chambers	—	—	—	1	—	—	—	—	—	—	1	—	2
Oakerthorpe	Geo. Pearson	—	—	—	—	1	—	—	—	—	—	—	—	1
Summerley	Jas. Rhodes & Son	—	—	—	—	—	1	—	—	—	—	—	—	1
Baddesley	W. S. Dugdale	—	—	—	—	—	1	—	—	—	—	—	—	1
Unstone	Rangeley & Son	—	—	—	—	—	1	—	—	—	—	—	—	1
Digby	Digby Coal Company	—	—	—	—	—	—	—	—	—	—	—	1	1
Ibstock	Ibstock Colliery Co.	—	—	—	—	—	—	—	1	—	—	—	—	1
Ilkeston	Ilkeston Colliery Co.	—	—	—	—	—	—	—	1	—	—	—	1	2
Unstone	Unstone Coal and Coke Co.	—	—	—	—	—	—	—	1	—	—	—	—	1
Ansley Hall	Ansley Hall Coal Co.	—	—	—	—	—	—	—	—	1	—	—	—	1
Plumbley	John Rhodes & Son	—	—	—	—	—	—	—	—	—	1	—	—	1
Ellistown	J. J. Ellis	—	—	—	—	—	—	—	—	—	—	1	1	2
New Brampton	Knowles and Wright	—	—	—	—	—	—	—	—	—	—	1	—	1
Hall End	Morris and Shaw	—	—	—	—	—	—	—	—	—	—	1	—	1
Coton Park	Coton Park Colliery Company	—	—	—	—	—	—	—	—	—	—	—	1	1
Heath End	John Lancaster & Co.	—	—	—	—	—	—	—	—	—	—	1	—	1
Manners	Manners Colliery Company	—	—	—	—	—	—	—	—	—	—	—	1	1
Donisthorpe	Checkland and Williams	—	—	—	—	—	—	—	—	—	—	1	1	2
Newstead	Newstead Colliery Company	—	—	—	—	—	—	—	—	—	—	—	1	1
Hundall	T. Hill & Co.	—	—	—	—	—	—	—	—	—	—	1	—	1
Coleorton	Checkland & Co.	—	—	—	—	—	—	—	—	—	—	—	1	1
	Total	25	25	30	22	31	38	39	23	27	46	30	31	367

TOTAL Number of DEATHS in the different COLLIERIES in the years 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, and 1878.

Name of Colliery.	Owner's Name.	Total Deaths in 14 years.
Staveley	Staveley Iron and Coal Company	66
Clay Cross	Clay Cross Iron and Coal Company	63
Butterley	Butterley Iron and Coal Company	59
Renishaw Park	J. and G. Wells, Limited	42
Eastwood, High Park, &c.	Barber, Walker, & Co.	41
Cinderhill, Newcastle, &c.	Babbington Coal Company	32
Sheepbridge, Norwood, &c.	Sheepbridge Iron and Coal Company	31

Name of Colliery.	Owner's Name.	Total Deaths in 14 years.
Swannington and Coleorton	Walker and Worswick	24
Birley Vale	Jeffcock, Dunn, & Co.	26
Bretby and Newhall Park	Countess of Chesterfield	22
Riddings	James Oakes & Co.	21
Whitwick and Ibstock	W. Whetstone & Co.	19
Moira, &c.	E. Abney Hastings	20
Butcher Wood and Pleasley	Stanton Iron Company	17
Tibshelf and New Birchwood	C. Seely & Co.	19
Snibston	G. R. Stevenson & Co.	13
Swadlincote, Cadley Hill	Hall and Boardman	13
Shipley	E. M. Mundy	13
Tapton	Tapton Coal Company	13
Stanton	J. and N. Nadin & Co.	14
Hawkesbury	J. Darlington & Co.	14
Hucknall Torkard	E. Ellis & Co.	12
Pilsley	Pilsley Colliery Company	13
Shirland	Shirland Colliery Co.	10
Shireoaks and Steetly	Shireoaks Colliery Company	12
Glascote	Firmstone and Co.	9
Derbyshire Silkstone	Derbyshire Silkstone Colliery Company	10
Swanwick	C. R. P. Morewood	9
Wingerworth	Wingerworth Coal Company	8
Pinxton	Coke & Co.	9
Grassmoor	Barnes Brothers	9
Charity	Addenbrooke & Co.	9
Renishaw	Chesterfield and Boythorpe Colliery Co.	9
Clifton	Clifton Coal Company	7
Granville	Granville Colliery Company	7
Denby	W. D. Lowe	6
Oakerthorpe	George Pearson & Co.	6
Annesley	Annesley Colliery Company	13
Baddesley	W. S. Dugdale	6
Netherseal	Netherseal Coal Company	7
Mapperley	Glendon Iron Company	6
Kilburne	Geo. and Thomas Small	7
Molyneux	Eastwood & Swingler	5
Victoria	— Troughton	5
Brampton	Knowles, Wright, & Co.	6
Unstone	H. Rangeley and Son	5
Blackwell	Blackwell Colliery Co.	9
Gresley Wood	Gresley Wood Colliery Company	4
Tibshelf and Blackwell	E. Chambers	5
Pooley Hall	Pooley Hall Colliery Company	4
Wilnecote	Perrins & Harrison	4
Skegby	Skegby Coal and Brick Company	4
Berristow Lane	G. Small & Co.	4
Digby	Digby Colliery Company	6
Foxley Oaks	Whittington Colliery Company	4
Birch Coppice and Hall End	Morris & Shaw	7
Stockingford	Stockingford Colliery Company	3
Haunch Wood	Nowell & Son	3
Denby and Ryefield	Denby Iron Company	3
Unstone	Unstone Coal and Coke Company	3
Bestwood	Bestwood Coal Company	6
Tame Valley	G. Skey & Co.	3
Compstall	G. Andrews and Company	3
New Whittington	John Stapleton	2
Newbold	Newbold Iron Company	2
Old Swadlincote	Church and Maples	2
Exhall	E. Wilson	3
Axedge	Buxton Lime Company	2
Summerley	James Rhodes and Son	2
Griff	C. N. Newdegate, M.P.	2
Wyken	Wyken Colliery Co.	3
Nailstone	J. Thornton	3
Linby	Linby Coal Company	2
Ansley Hall	Ansley Hall Coal Company	2
West Staveley and Hundall	T. Hill & Co.	3
Plumbley	John Rhodes	3
Wollaton	Wollaton Coal Company	4
Ellistown	J. J. Ellis	3
Woodhouse	Booker & Co.	1
Nuneaton New	Nuneaton New Colliery Company	1
Alton	Alton Coal Co.	1
Sutton	Executors of Richard Arkwright	1

Name of Colliery.	Owner's Name.	Total Deaths in 14 years.
Boythorpe	Chesterfield & Boythorpe Colliery Company	2
Birch Vale	Bennett & Son	1
West Hallam	F. Newdigate	1
Rutland	Rutland Colliery Company	1
Bagworth	Bagworth Coal Company	1
Danesmoor	Smith and Shepherd	1
Bridgehouse	J. Sayer	1
Owl Cotes	Galloway & Co.	1
Stoneyford	James Oakes & Co.	1
Burned Edge	L. & E. Hall	1
Stapleford	Stapleford Colliery Company	1
Wingfield Lane	Samuel Lowe	1
West Hallam	A. Whitehouse & Co.	1
Ilkeston	Ilkeston Coal Company	2
Shipley Gate	Bentley & Pounder	1
Fernilee	W. Proctor	1
Donisthorpe	Checkland and Williams	5
Coleorton	Checkland & Co.	1
Hockley Hall and Whateley	Hockley Hall Colliery Company	1
Newstead	Newstead Colliery Company	1
Dale	Stanton Iron Company	1
Peacock	Shorthouse and Gregory	1
Cutthorpe	Hoskin & Co.	1
Awsworth	Awsworth Iron Company	1
Woodville	Barry & Co.	1
Coton Park	Coton Park Colliery Co.	1
South Leicestershire	South Leicestershire Coal Co.	1
Holmewood	Hardwick Coal Company	1
Wilnecote	George Skey	1
Manners	Manners Colliery Co.	
Heath End	John Lancaster & Co.	2
Southgate	Shireoaks Colliery Co.	1

LIST of MINES classed under the Coal Mines Regulation Act in the Midland District, 1878.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
DERBYSHIRE.				
Andrews, Brothers, Dronfield	Silkstone	Silkstone Main	Dronfield	William Minikin.
Andrews and Son, Compstall, Stockport.	Mountain	Compstall Road	Marple	S. C. Wardell.
Arkwright, William, Chesterfield.	Top Hard	Sutton	Sutton	William Brooks.
Aspenshaw Coal Company, Hayfield, Stockport.	Mountain	Aspenshaw Tunnel	Hayfield	Abel Clayton.
Alton Coal and Coke Company, Chesterfield.	Sinking	Sinking	Ashover	Standing.
Ambergate Coal and Brick Company.	Naughton	Ambergate	Ambergate	Standing.
Badger, A. and W. T., Dronfield.	Silkstone	Fallswood	Dronfield	Daniel Brown.
Barton, Francis Whatstandwell, Ambergate.	Mountain	Wigwell	Ambergate	Matthew Shaw.
Barber, Miles, Barlboro	High Hazle	Barlboro	Barlboro	Herbert Barber.
Barnes, Messrs., Grassmoor, Chesterfield	Dunston Ell Silkstone	No. 2, Grassmoor No. 3 „ No. 1 „	Chesterfield	Edward Bromley, Agent. Benjamin Bamford, Manager.
Bedford, W., and Company	Silkstone	Kitchen Wood	Dronfield Woodhouse.	
Beardsley and Smith, Ilkeston	Deep Soft	Carr Close	Ilkeston	L. Robinson.
Beardsley, John	Top Hard Comb	Ormonde Clinton	Langley Mill	John Beardsley.
Belper Lawn Colliery Company	Belper Lawn	Belper	Belper	Standing.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Bennett, Thomas, New Mills, Stockport	Mountain	Birch Vale	New Mills	Joseph Hyde. David Ashworth.
	Ditto	Bugsworth		
	Ditto	High Lee		
	Ditto	Thornsett Hey		
	Ditto	Dolley Tunnel		
Benton and Woodiwiss	Silkstone	Shirland, No. 1	Alfreton	Jeremiah Rhodes.
Black, C., and Company	Deep Soft	Renishaw	Chesterfield	Elijah Houfton.
	Silkstone			
Blackwell Colliery Company, Limited, Alfreton	Deep Hard	No. 2, A. Winning.	Alfreton	J. Alfred Longden and Agent.
	Tupton	No. 1, „		
	Silkstone	„ „		
	Deep Hard	No. 3, B. Winning.		
	Tupton	No. 4, „		
Booker, William, and Company.	Silkstone	Woodhouse, Nos. 1 and 2.	Dronfield	Isaac Salt.
Bourne and Son	Fireclay	Ryefield	Denby	Robert Dale, Agent.
Bridden, W. and H.	Deep Hard	Brockwell	Chesterfield	W. F. Howard, M.E., Agent.
Butterley Iron and Coal Company, Alfreton	Deep, Hard, and Soft.	Butterley Park, No. 5.		Richd. J. Strick and Agent.
	Deep, Hard, Soft, and Ell.	Forty Horse	Ripley	
	Deep, Hard, and Soft.	Britain	Butterley	
	Deep Soft Coal	Brands	„	
	Soft and Ell	Western	„	
	Deep, Hard, and Soft.	Ripley, Nos. 1 and 2	Ripley	
	Ditto	Hartshay	„	
	Ditto	Waingroves	„	
	Ditto	Railway	„	
	Deep, Hard, and Soft.	Calley	Ripley	
	Ell and Ironstone.	Brickyard	„	
	Silkstone	New Main, No. 7	Codnor Park	
	Silkstone and Kilburne.	„ No. 8	„ „	
	Kilburne	Exhibition, No. 9	„ „	
	Sinking	Denby		
	Deep, Hard, and Soft.	Langley	Langley Mill	
	Sinking	Old Birchwood	Alfreton	
	Deep, Hard, and Soft.	Bailey Brook	Langley Mill	
	Ditto	Loscoe	„ „	
	Ditto	Old Granby	Ilkeston	
Buxton Lime Company, Buxton	Mountain	Goyte	Buxton	H. A. Hubbetsey, Agent. William Day.
	Ditto	Thatchmarsh		
	Ditto, and Smithy or 16-inch Mine.	Whaley	Whaley Bridge	Thomas Srigley.
	Red Ash or 18-inch Mine.	Horwich Tunnel		
Chambers, Edward	Top Hard	Tibshelf	Tibshelf	C. R. Morgan and Agent.
	Ditto	Diminsdale (Old)		
	Dunsil	Diminsdale (New).		
Chesterfield and Boythorpe Colliery Company	Tupton	Boythorpe Lane	Chesterfield	Michael Straw.
	Silkstone	Silkstone		
Clay Cross Iron and Coal Company	Silkstone and Cannel.	Clay Cross, No. 1	Clay Cross	T. D. Croudace, Manager. Charles Binns, Agent.
	Silkstone	„ „ No. 2		
	Tupton	„ „ No. 3		
	Deep Hard	Moreton „ No. 6		
	Silkstone	„ „ No. 5		
	Ditto	Park House, No. 7		
	Ditto	North Wingfield, No. 4		
	Tupton	Danesmoor, No. 8		

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Coke and Company, Alfreton	Top Hard Deep, Hard, and Soft. Tupton	Langton Sleights, Nos. 1 and 6. Pinxton, No. 3	Pinxton	B. T. Chadborn and Agent.
Coton Park and Lenton Colliery Company.	Moira Main	Coton and Lenton	Lenton, Burton	Hargreave Walters.
Countess of Chesterfield, Burton-on-Trent	Eureka Woodfield Stanhope Nether, Woodfield, and Eureka.	Bretby, No. 1 „ No. 2 „ No. 3 Newhall Park	Burton-on-Trent.	William Johnson and Agent.
Cursham, Wm. G.	Kilburne Sinking	Heage Sinking	Belper	Samuel Allsop.
Crooks, John Brampton, Chesterfield	Silkstone Ditto	Holme Bridge Inn	Chesterfield	W. F. Howard, Agent (standing).
Dawes, C. and W. H., Denby, Derby	Tupton Ditto Ironstone	Salterwood Ryefield, No. 1 „ No. 2	Denby	William Tomlinson.
Derbyshire Silkstone Coal Company, Chesterfield.	Silkstone	Albert	Sheepbridge	Reuben Allen.
Dronfield Silkstone Coal Company, Dronfield	Sinking Silkstone Ditto	Hallows Farm Dronfield Silkstone. Gosforth	Dronfield	William Francis Addy.
Edwards, H. J.	Tupton	Holme Close	Chesterfield	
Evans, Wigfield, and Company, Staveley.	Yard Coal	St. John's	Staveley	William Clifford.
Fletcher, Henry, Heanor Lane, Langley Mill.	Top Hard and Comb.	Heanor Lane	Langley Mill	Henry Fletcher.
Galloway, Messrs., Manchester.	Top Hard	Owl Coates	Chesterfield	Samuel Hague.
Gillett, Brothers	Comb	Heanor Common Side.	Heanor	Isaac Gillot.
Glendon Iron Company, Ilkeston.	Deep, Hard, and Soft.	Mapperley	Ilkeston	George Lewis, M.E.
Gosling and Company	Top Hard	Hollingwood	Eckington	Fredk. Gosling.
Gregory and Sharratt, Chesterfield.	Tupton	Reservoir	Chesterfield	Henry Sharratt.
Granville Colliery Company, Burton-on-Trent.	Main and Little.	Granville	Swadlincote	Edward Hedley, M.F.
Green and Company	High Hazels	Newlands	Eckington	Standing.
Hall, L. and E., New Mills, Stockport	Mountain Mine Ditto Ditto Ditto	Beard and Bugsworth. Burn'd Edge, No. 1. Burn'd Edge, No. 2. Shale Cross	New Mills	Samuel Hall.
Haslam, W. C., Ripley	Deep, Hard, and Soft.	Pentrich	Ripley	George Bowler.
Hardwick Coal Company, Chesterfield	Silkstone Tupton Ell Hartington	Holmewood	Chesterfield	John Ward and Agent.
Hargate and Chadwick	Gannister	Totley Moor	Dronfield	W. F. Howard, Agent.
Hastings, Charles F., Abney	Moira Main	Church Gresley	Burton-on-Trent.	F. C. Gillett, Agent. R. E. Cresswell.
Hayes, Thomas, and Company	Ashgate	Old Brampton	Chesterfield	W. F. Howard, Agent.
Hall and Boardman, Burton-on-Trent	Main Woodfield Eureka Woodfield New Mine & Main.	Cadley Hill, No. 1 „ „ No. 2 „ „ No. 3 Swadlincote, Nos. 1, 2, and 3.	Burton-on-Trent.	Alfred Eley. William Eley, Agent.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Heanor and Marlpool Colliery Company.	Comb	Marlpool	Heanor	H. Parsons, Agent.
Hewitt, John, Linby, Unstone	Norton Silkstone	Bull Close	Unstone	John Carr.
Hobson, Matthew, Ilkeston	Tupton	Mill Field	Ilkeston	Joseph Baker.
Holdsworth, Thomas, Clay Cross	Ell Sinking	Alma Sinking	Clay Cross	Wm. Pendleton.
Holdsworth and Company, Chesterfield	Tupton Deep Hard Silkstone	Pilsley, No. 3 „ No. 1 „ No. 2	Chesterfield	Thomas Holdsworth, Agent. Samuel Godber.
Holford, W. D., Whittington, Chesterfield.	Ditto	Hill House	Whittington	W. D. Holford and Agent.
Hucknall Huthwaite Company, Mansfield.	Standing	Hucknall Huthwaite.	Mansfield	Standing.
Hundall Colliery Company	Silkstone	Hundall	Chesterfield	John Park. W. T. Hill, Agent.
Hunt, Robert	Ditto	Ripley Road	Ripley	Robert Hunt.
Ilkeston Colliery Company	Kilburne	Oakwell	Ilkeston	John Wilmot Fearn.
Industrial Coal Company	Dunsil Ditto	Hasland Storforth Lane	Chesterfield	Elijah Houfton.
Jeficock and Dunn, Sheffield	Silkstone Ditto	Birley South „ West	Sheffield	Thos. Wm. Jeffcock, Agent. Rich. John Barnes.
Jowitt, J. Mellor, Stockport	Mountain Ditto Ditto	Chisworth Mellor Alma	New Mills	Isaac Marshall.
Jowitt and Clayton, Charlesworth, Manchester.	Two Sheds	Simmondsley	Glossop	James Clayton.
Knowles and Company, Whittington, Chesterfield.	Silkstone Ditto	Grasscroft Wood Forge	Whittington	Israel Knowles.
Knowles, Wright, and Knowles, Chesterfield.	Ditto	New Brampton	Chesterfield	W. F. Howard, M.E.
Kirby and Cross, Clay Cross, Chesterfield	Ditto Ditto Tupton	Cumberland Newmarket Furnace	Clay Cross	E. F. Hall.
Lancaster, William	Fire Clay	Wheeldon Mill	Chesterfield.	Standing.
Lowe, W. D., Denby, Exors. of	Kilburne Deep Soft	Denby Salterwood (New)	Denby	Uriah Hunt. Richard Purvis, Agent.
Marshall and Tingle	Top Hard	Bole Hill	Alfreton	Samuel Marshall.
Maples and Company, Swadlincote, Burton-on-Trent	Stanhope Woodfield	Stanhope Woodfield	Swadlincote	Thomas A. Wilson.
Marehay Colliery Company	Tupton	Marehay, Nos. 3, 4	Ripley	Joseph Hall.
Manners Colliery Company, Ilkeston	Kilburne	Manners	Ilkeston	George Lewis.
Monkwood Colliery Company	Silkstone Ditto	Monkwood (Old) Barlow Lees	Chesterfield	Robt. Henry Robinson.
Moorwood, C. R. P., Alfreton	Deep Soft Top Hard and Waterloo.	Swanwick (Deep) „ (Old)	Alfreton	Edwin Eardley.
Mundy, Alfred M.	Deep Hard Deep Hard and Soft. Deep Soft Deep Hard	Newcastle Woodside Nutbrook Coppice	Shipley	F. G. Gillett, Agent.
Nadin, Messrs. J. and N., Burton-on-Trent	Woodfield Main Stanhope Eureka	Woodfield Main Stanhope Eureka	Swadlincote	George Lewis, Viewer.
Naylor, Henry, Chesterfield	Tupton Piper	Brockwell Road Newbold Lane	Chesterfield	Henry Naylor.
Newdigate, Lieut.-Col.	Deep Soft	West Hallam	Ilkeston	F. G. Gillett, Agent. Edwin Eardley.
Nichols, William, Chesterfield	Piper	Riber	Brampton	W. F. Howard, Agent.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Nichols, Thomas	-	Old Brampton	Chesterfield	
Northfield Colliery Company	Deep Hard	Northfield	Shirland	Richard Swann.
North Wingfield Colliery Company.	Ell	Ell	Clay Cross	Herbert Smith.
Oakes, J., and Company Alfreton	Silkstone	Blackshale	Alfreton	G. W. Laverick and Agent.
	Deep, Hard, and Soft.	Coates Park		
	Ditto	Stonyford		
	Kilburne	Deep Main, Nos. 1, 2		
Orwin, George, Newbold, Chesterfield.	Dunston	Old Dunston	Chesterfield	George Orwin.
Pearson, Joseph	Piper	Old Park	Ilkeston	Standing.
Pearson, Theophilus, Chesterfield.	Deep Hard	Highfield	Chesterfield	James Ash.
Pearson, George, and Company, Alfreton	Silkstone	Oakerthorpe	Wingfield	William Burdess.
Plevins, C. H., and Company, Newbold, Chesterfield	Ditto	Blackshale	Newbold	Standing.
	Deep Hard	Potters		
Proctor, William, Stockport	Mountain	Fernilee	Whaley Bridge	Standing.
Rangeley, Henry, and Son, Unstone, Sheffield.	Silkstone	Drift	Unstone	Robt. H. Redhead.
Renishaw Coal and Iron Company, Chesterfield	Top Hard	Cottam (Old)	Eckington	Ernest Hague.
	Ditto	„ (New)		
Rhodes, Brothers	Silkstone	Troway	Dronfield	John Newton.
	Sinking	Sickle Brook Lane		
Rhodes, James, and Son	Silkstone	Summerley	Unstone	Jonathan Rhodes and Agent.
Rhodes, John	Ditto	Plumbley	Eckington	William Chadwick.
Richardson and Vardy, High Lane, Eckington.	Ditto	White Lane	Ditto	W. F. Howard, Agent.
Rutland Coal Company	Deep Soft	Rutland, Nos. 3, 4,	Ilkeston	J. W. Fearn.
Saxon, Samuel	Silkstone	Unstone	Unstone	Standing.
	Hazel	Woodhouse Lane	Eckington	
Senior, George	Deep Hard	Highfield	Chesterfield	Edward Senior.
Sheard, John, Dronfield	Silkstone	Gomersal	Dronfield	John Sheard, Owner.
Seely, Charles, and Company, Alfreton	Tupton	Tibshelf, No. 1	Alfreton	S. C. Wardell, M.E., and Agent.
	Deep Hard	Ditto No. 2		
	Silkstone	Ditto No. 2		
	Ditto and Tupton	Shady		
Sheepbridge Coal and Iron Company, Chesterfield	Top Hard	Norwood	Eckington	John William Tankard.
	Deep Hard	Sheepbridge	Sheepbridge	William Wilde, M.E., and Agent.
	Silkstone	Dunston		
	Ditto	Nesfield		
	Top Hard	Langwith	Langwith	
	Silkstone Ironstone.	Barlow	Sheepbridge	
Shirtcliffe, John	Hazle	Killamarsh	Eckington	W. F. Howard, Agent.
Shorthouse, Joseph	Waterloo	Peacock	Ilkeston	J. W. Fearn.
South Normanton Colliery Company, Alfreton.	Top Hard	Winks Bank	South Normanton.	William Boole.
Small, G. and T., Kilburne, Derby	Kilburne	Kilburne	Kilburne	George Small and Agent.
	Ditto	Stanley	Stanley	John Povey Harper.
Stanton Iron Company	Kilburne	Dale, Nos. 1, 2	Stanton Gate	Walter Fowler. William Hopkins, Agent.
	Top Hard	Pleasley	Mansfield	William Clarke and Agent.
Staveley Coal and Iron Company, Chesterfield	Silkstone	Campbell	Staveley	Joseph Humble. Charles Markham, Managing Director.
	Deep Soft	Hollingwood (Old)		
	Ditto	„ (New)		
	Top Hard	Seymour		
	Silkstone Ironstone.	Springwell		
	Top Hard	Barlborough		
	Deep Soft	Ireland		

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Stretton Colliery Company	Tupton	Stretton	Clay Cross	William Fletcher.
Shireoaks Colliery Company	Top Hard	Southgate	Staveley	E. E. Carr.
Swift and Allen	Silkstone	Snowdon Lane	Dronfield	C. Swift.
Shore, Isaac	Lawn	Gun Lane	Heage	Isaac Shore.
Springthorpe, Joseph	Tupton	Cutthorpe	Chesterfield	J. Springthorpe.
Temple Normanton Colliery Company.	Top Hard	Temple Normanton	Chesterfield	Standing.
Tapton Coal Company, Limited, Chesterfield	Silkstone	Wallsend	Chesterfield	Standing.
	Ditto	Locoford		
Tymm, J. and M., Marple, Stockport.	Mountain	Bottoms Hall	Marple	Wright Tymm.
Tyler and Woodward	Tupton	Gents Hill	Clay Cross	Standing.
Unstone Coal and Coke Company, Limited.	Silkstone	Unstone	Unstone	Thos. Fenwick, Agent. George Hewitt.
Wells, J. and G., Trustees	Silkstone	High Lane	Eckington	W. E. Wells.
Wells, Joseph and George, Ecklington, Chesterfield	Silkstone	Silkstone, Nos. 1 and 2	Eckington	W. Edwin Wells.
	Deep Hard	Park Gate, Nos. 3 and 4		
	Silkstone	Hornthorpe	Eckington	George Mosby.
	Ditto and Parkgate.	Holbrook	Killamarsh.	
West, H. H., Langley Mill	Comb Coal	New Heanor	Langley Mill	J. W. Fearn.
Whittington Coal Company, Chesterfield.	Silkstone	Foxley Oaks	Whittington	W. D. Holford and Agent.
Whittington and Sheepbridge Coal Company	Ditto	Broom Field	Sheepbridge	Standing.
	Deep Hard	Ditto		
Whitehouse and Son, West Hallam, Ilkeston	Deep, Hard, and Soft	West Hallam, No. 1.	Ilkeston	John Hawley
	Black Ironstone.	„ No. 10		
	Kilburne	Kirk Hallam		
Wingerworth Coal Company, Chesterfield	Deep, Soft	Avenue	Chesterfield	John Ward and Agent.
	Top Hard	Williamthorpe		
	Ditto	Lings		
Woodward, James, Swadlincote, Burton-on-Trent.	Fire Clay	Clay Pits, Nos. 1 and 2.	Swadlincote	Robert Fearn.

NOTTINGHAMSHIRE.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Annesley Coal Company	Top Hard	Annesley, Nos. 1 and 2.	Nottingham	Henry Lewis and Agent.
Awsworth Iron and Coal Company	Tupton	Furnace	Eastwood	Samuel Whitehead and Agent.
	Silkstone	Blackshale		
	Ironstone	Ironstone		
Barber, Walker, and Company, Eastwood	Deep Hard and Soft.	Brinsley	Eastwood	William Weston. Robert Harrison, Agent.
	Ditto	Cotmanhay		
	Ditto	Eastwood		
	Top Hard	High Park		
	Deep Hard and Soft.	Moor Green		
	Deep Soft	Underwood		
	Top Hard	Watnall (Old)		
	Ditto	Watnall (New)		
Beardsley John, Langley Mill	Top Hard	Clinton	Langley Mill	William Moody.
Bestwood Coal Company, Nottingham	Top Hard	Bestwood, Nos. 1 and 2	Bestwood	William Read. Howard Allport, Agent.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Butterley Iron and Coal Company -	Top Hard -	Portland, No. 1 -	Kirby -	Richd. J. Strick and Agent.
	Ditto -	„ Nos. 2 and 4		
	Ditto -	„ No. 6 -		
	Ditto -	Mexbro' (North)	Selston -	
	Ditto -	„ (South)		
	Ditto -	„ (Bottom)		
	Deep Hard and Soft.	Plumptre	Eastwood	
Clifton Colliery Company, Limited - -	Deep Hard -	Clifton, No. 1 -	Nottingham -	Henry Fisher and Agent.
	Deep Soft -	„ No. 2 -		
Digby Coal Company, Eastwood - - -	Deep Hard and Soft.	Speedwell -	Eastwood -	Herbert Phillips. — Potter, Agent.
	Ditto -	Digby - -		
	Ditto -	New London -		
Dunn, D. G., and Co. - -	Deep Hard -	Stapleford - -	Stanton Gate	Suspended.
Ellis and Company, Nottingham - - -	Top Hard -	Hucknall, No. 1 -	Hucknall Torkard.	James Heslop. J. W. Ellis, Agent.
	Ditto -	„ No. 2 -		
Hall, William - -	Tupton -	Lodge - -	Eastwood -	William Hall.
Knighton and Smith, Eastwood	Top Hard -	Springfield -	Ditto -	H. A. Knighton.
Linby Coal Company, Nottingham.	Ditto -	Linby - -	Linby -	Henry Lewis and Agent.
Lynch and Cadogan, Cossall, Nottingham - -	Kilburne -	Cossall - -	Cossall -	Walter C. Fowler. W. Lynch, Agent. John Eaton.
	Piper -			
Mellers, Nathan, Newton -	Top Hard -	Molyneux -	Teversall -	W. Field Cowen.
	Dunsil -			
Newstead Colliery Company -	Top Hard -	Newstead - -	Newstead -	Robert Stevenson and Agent.
New and Oldknow, Nottingham.	Deep Hard and Soft.	Wollaton - -	Wollaton -	George Lewis, M.E.
New Hucknall Colliery Company.	Top Hard -	New Hucknall -	Mansfield -	Simeon Watson.
Oakes, J., and Company, Alfreton - -	Deep Hard and Soft.	Pollington -	Pye Bridge -	George Wales Laverick and Agent.
	Ditto -	Tunnel - -		
	Silkstone -	New Silkstone -		
	Low Main -	Selston - -		
Seely, Charles, and Company, Nottingham -	Top Hard -	Bulwell - -	Basford -	George Fowler and Agent.
	Ditto -	Cinder Hill, Nos. 1 and 4.		
	Ditto -	Newcastle -		
	Deep Soft -	Babbington -		
	Ditto -	Kimberley - -		
Skegby Coal and Lime Company - - -	Top Hard and Dunsil.	Brierley Hill -	Mansfield -	D. Ashton. Gillett and Sankey, Viewers.
Stanton Iron and Coal Company - - -	Ditto -	Teversall, No. 1 -	Ditto -	William Clark and Agent.
	Ditto -	„ No. 2 -		
	Sinking -	Silver Hill - -		
Shireoaks Colliery Company	Top Hard -	Shireoaks, Nos. 1 and 2.	Shireoaks -	C. Tylden Wright, Agent. John Jones.
	Ditto -	Steetley Wood -		

WARWICKSHIRE.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Amington Colliery Company, Tamworth	Seven-feet and Ryder Coal and Ironstone.	Amington, No. 1	Tamworth	F. A. Grayston and Agent.
		,, No. 2		
	Seven-feet Coal, Ryder, and Ironstone.	Glascote		
Ansley Hall Colliery Company, Atherstone	Ryder	Ansley, No. 1	Atherstone	John Slack.
	Ell	,, No. 2		
	Seven-feet	,, No. 3		
Bedworth Coal and Iron Company, Bedworth	Seven-feet, Ryder, and Slate.	Woodlands	Bedworth	George Barker.
	Black Ironstone.	Ironstone, No. 9		
Dugdale, W., Atherstone	Rider	Baddesley	Atherstone	J. Pogmore, Agent. John Parker.
Dumolo, T., Tamworth	Seven-feet	Kettlebrook	Tamworth	Joseph Millward.
Gibbs and Canning, Wilnecote, Tamworth.	Fire Clay	Wilnecote	Ditto	John Brain.
Hawkesbury Colliery Company, Coventry	Two-yard	Fly	Coventry	Joseph Cunliffe.
	Ell, Ryder, Slate, Coals, and Blue and White Ironstone.	Hawkesbury		
		Speedwell		
		New Winnings		
		Balance		
Harris, J. and W. S., Coventry.	Slate	Craven	Ditto	Henry Sanders.
Hockley Hall Colliery Company, Tamworth	Rider	Whateley, Nos. 5, 6	Tamworth	John Williams.
	Seven-feet	Seven-foot		
	White Ironstone	Ironstone		
Marshall, C., Alvecote, Tamworth.	Seven-feet	Alvecote	Ditto.	George Percival.
Morgan, Davis, and Company, Wilnecote, Tamworth.	Ryder	Dost Hill	Ditto	James Davies.
Morris and Shaw, Tamworth	Seven-feet	Birch Coppice	Ditto	George Morgan. — Morris, Agent.
	Ditto	Hall End		
Newdegate, Charles, M.P., Nuneaton	Slate and Seven Feet.	Charles Pit	Nuneaton	Ralph Harrison.
	Two-yard	Griff, No. 5		
	Slate	,, No. 4		
	Seven-feet	,, No. 7		
Nowell and Son, Nuneaton	Slate and Seven-feet and Two-yard.	Haunch Wood	Ditto	John Nowell.
Perrins and Harrison, Wilnecote, Tamworth.	Seven-feet	Wilnecote	Tamworth	Samuel Barton.
Pooley Hall Colliery Company	Ditto	Pooley Hall	Ditto	R. Smallman, Viewer. Stephen Wilson.
Skey and Company, Wilnecote, Tamworth	Smithy	Tame Valley	Tamworth	Simeon Fenn. R. Smallman, Viewer.
	Seven-feet	Ditto		
	Bench	Peel, No. 2		
	Seven-feet and Clay.	New Pit, No. 7		
Smallman and Company, Nuneaton	Seven-feet	Harts Hill	Stockingford	Humphrey Randle. R. Smallman, Agent.
	Ironstone	Ditto		
Stanley Brothers, Nuneaton	Seven-feet	Nuneaton	Nuneaton	Henry Hall.
	Slate Coal	Ditto		

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Wilson, E., Bedworth	Slate, Ell, and Ryder.	Exhall	Bedworth	E. Wilson, Owner and Agent. John Harrison.
Wyken Coal Company, Coventry	Slate, Ell, and Ryder.	Walsgrove	Wyken	Thos. S. Whittem and Agent.
	Black and White Ironstone.	Ironstone, Nos. 1, 2, and 3		
	Sinking	Alexandra		

LEICESTERSHIRE.

Appleby Magna Colliery Company, Snareston.	Sinking	Snareston	Snareston	Suspended.
Barry and Co., Woodville, Burton-on-Trent	Fire Clay Ell Coal	Gresley Works	Burton	James Randall.
Bagworth Coal Company, Bagworth	Lower Main	Bagworth, Nos. 1 and 2.	Bagworth	George Wilson. George Lewis, Agent.
Boothorpe Brick and Coal Company.	Fire Clay and Coal.	Boothorpe	Swadlincote	Isaac Brooks.
Checkland, Son, and Williams, Donisthorpe	Moira Main	Donisthorpe, No. 1	Moira	Henry Taylor.
	Sinking	„ No. 2		
Checkland and Son	Upper Main Lower Main	Coleorton	Ashby	George Lewis, M.E.
Desford Colliery Company, Desford.	Sinking	Lindridge	Desford	Standing.
Ellis, Joseph Joel	Upper Main Lower Main	Ellistown	Bagworth	John George Wild.
Ensor, Edward	Fire Clay and Ell Coal.	Pool Clay Pits	Woodville	James Adams.
Heather Colliery Company	Spire Coal	Heather, No. 3	Ibstock	Amos Elliott.
	Main Coal	„ No. 4		
Hastings, Charles Frederick, Abney, Moira	Moira Main	Reservoir	Moira	German Buxton (F. C. Gillett. W. German.)
	Ditto	Moira	Ditto	
	Ditto	Oakthorpe	Ashby	Thomas Bradshaw.
	Ditto	Rawdon	Moira	Thomas Bourn
	Nether Coal and Clay.	Blackfordby	Woodville	Alfred Eley.
Holmes and Hulme	Fire Clay	Blackfordby	Ditto	
Ibstock Coal Company, Coalville	Moira Main	Ibstock, No. 1	Ibstock	John Strain.
	Ditto	„ No. 2		
Knowles and Co., Woodville	Fire Clay	Mount Pleasant Nos. 1, 2	Woodville	William Pickering.
	Ditto	Newfield, Nos. 1, 2		
Lancaster, John, and Company, Ashby-de-la-Zouch.	Cannel	Heath End	Stanton Harold	Geo. Wm. Lancaster.
Netherseal Colliery Company	Main	Netherseal	Netherseal	Robert Howe and Agent.
Perry, Captain, Boothorpe	Ell	Plough Flats, Nos. 3 and 4.	Woodville	W. F. Perry.
South Leicestershire Colliery Company.	Lower Main Upper Main	South Leicestershire	Bardon Hill	George Lewis.

Owner or Company and Postal Address.	Name of Coal worked.	Name of Mine or Colliery.	Where situated.	Agent or Manager.
Stephenson, G. R., and Company, Coalville	Main Roaster Roaster	Snibston, No. 1 ,, No. 2 ,, No. 3	Coalville	George Vaughan, Agent. Jason White.
Thornton, Joseph	Upper Main Lower Main	Nailstone	Bagworth	Hedley Edward, Viewer. William Bridget.
Whitwick Colliery Company, Coalville	Main Ditto Minge Splent Roaster	Whitwick, No. 3 ,, No. 4 ,, No. 5 ,, No. 2 Speedwell	Coalville.	R. A. Smith.

SUMMARY of PERSONS EMPLOYED in and about the MINES, and TONS of MINING PRODUCE, in the MIDLAND DISTRICT, during the Year 1878.

NAMES OF COUNTIES.	Underground.					Above ground—Ages.							Total above and below ground.	Coal.	Fireclay.	Ironstone.	Pyrites.	Gannister and Shale.
	Male Persons—Ages.					10 to 13.		13 to 16.		Above 16.		Total.						
	10 to 12.	12 to 13.	13 to 16.	Above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.							
Derbyshire	–	165	2,348	18,677	21,190	12	–	598	–	–	5,175	5,785	26,975	7,289,380	9,286	38,776	958	*505
Nottinghamshire	–	44	1,072	9,517	10,633	13	–	209	–	–	3,056	3,278	13,911	4,106,392	—	7,487	101	—
Warwickshire	–	29	261	2,869	3,159	3	–	68	–	–	961	1,032	4,191	1,022,915	13,080	28,628	1,548	1,590
Leicestershire	–	27	307	2,854	3,188	8	–	84	–	–	997	1,089	4,277	1,021,497	33,142	35	—	—
Total	–	265	3,988	33,917	38,170	36	–	959	–	–	10,189	11,184	49,354	13,440,184	55,508	74,926	2,607	2,095

* Includes 25 tons of petroleum.

THOMAS EVANS.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the MIDLAND DISTRICT, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878.														
Jan. 2	1	Britain - -	Butterley -	Butterley Iron and Coal Co.	Edward Edwards -	Loader -	31	Fall of bind from a faulty place in the roof.	–	1	–	–	–	1
„ 2	2	Albert - -	Newbold Chesterfield.	Derbyshire Silkstone Coal Co.	George Riley -	Stallman -	44	Fall of roof. Getting coals out from a loose end.	–	1	–	–	–	1
„ 7	3	Norwood - -	Killamarsh -	Sheepbridge Iron and Coal Co.	John Whitlam -	Datler -	62	Fall of roof. Deceased men were building packs when the roof gave way. Packs had been left too far behind.	–	1	–	–	–	1
					Charles Mallender	Ditto -	53		–	1	–	–	–	1
„ 9	4	Eastwood -	Eastwood - -	Barber, Walker, & Co. -	Thomas Leverton -	Loader -	48	Fall of roof whilst taking coals down.	–	1	–	–	–	1
„ 16	5	Donisthorpe -	Donisthorpe -	Checkland and Williams -	William Whetton -	Stallman -	44	Fall of coal and bind. Deceased was getting top coal from over the stall packs in the goaf.	–	1	–	–	–	1
„ 19	6	Coleorton - -	Ashby-de-la-Zouch.	Checkland and Williams -	John Ward -	Holer -	19	Falls of coals whilst wedging them down.	–	1	–	–	–	1
„ 22	7	No. 1, Renishaw Park.	Eckington -	J. & G. Wells (Limited) -	Gabriel Cole -	Stallman -	43	Killed by a fall of bind whilst getting top coal down near a fault slip.	–	1	–	–	–	1
„ 29	8	New London -	Digby - -	Digby Colliery Co. -	Joseph Houfton -	Ditto -	30	Fall of roof, the stall well timbered. Roof fell between the timbering and the face.	–	1	–	–	–	1
„ 31	9	Ellistown -	Bagworth - -	J. J. Ellis - -	Thomas Farmer -	Furnace man	70	Fall of roof coal near the furnace, probably caused either by the heat of the furnace or shot firing in a new furnace drift.	–	1	–	–	–	1
Mar. 8	10	Ibstock - -	Ibstock - -	Ibstock Colliery Co. -	Thomas Farmer -	Driver -	13	Run over by loaded tubs. Boy neglected to put lockers in the wheels.	–	–	–	1	–	1
„ 11	11	Holbrook -	Killamarsh -	J. and G. Wells (Limited)	Jacob Crooks -	Sinker -	34	Removing air pipes in the shaft when they broke loose and fell upon the deceased, killing one on the spot, the other died in a few days after.	–	–	1	–	–	1
					James Gilbert -	Ditto -	32		–	–	1	–	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878.														
Mar. 15	12	Seymour -	Staveley - -	Staveley Coal and Iron Co.	William Revil -	Stallman -	48	Fall of coals, bursting off the face of work.	–	1	–	–	–	1
„ 23	13	Coton Park -	Gresley - -	Coton Park Colliery Co. -	James Ashwell -	Collier -	37	Fall of roof - - - -	–	1	–	–	–	1
„ 30	14	Hawkesbury -	Bedworth -	Hawkesbury Colliery Co.	William Harrison -	Ditto -	46	Caught by the cage at the pit top.	–	–	1	–	–	1
April 4	15	Old Watnall -	Kimberley -	Barber, Walker, & Co. -	John Burrows -	Stallman -	24	Fall of roof whilst taking the coals down.	–	1	–	–	–	1
„ 18	16	New Langley -	Langley Mill -	Butterley Iron and Coal Co.	William Beswick -	Ditto -	45	Fall of bind from between the timber.	–	1	–	–	–	1
May 9	17	No. 1, Grassmoor	Chesterfield -	A. Barnes & Co. - -	William Dove -	Driver -	18	Fall of bind - - -	–	1	–	–	–	1
„ 25	18	Boythorpe -	Chesterfield -	Boythorpe Colliery Co. -	Edward Watts -	Ditto -	16	Playing with other boys on the pit bank after finishing their work in the pit. One of the boys turned the steam into the coal hoist, which struck deceased.	–	–	–	–	1	1
„ 30	19	Wollaton -	Nottingham -	Wollaton Colliery Co. -	James Drange -	Stallman -	48	Explosion of powder - -	–	–	–	1	–	1
June 26	20	No. 5, Whateley -	Tamworth -	Hockley Hall Colliery Co.	Joseph Dickenson -	Horse keeper	41	Engineman mistook the signal and crushed deceased between the chair and the brickwork at the pit bottom.	–	–	1	–	–	1
„ 29	21	Dale - -	Stanton Gate -	Stanton Iron Co. - -	William Pheasant -	Carpenter -	21	Fastening of the rope gave way whilst deceased was descending the shaft.	–	–	1	–	–	1
July 1	22	Southgate - -	Near Chesterfield	Shireoaks Colliery Co. -	William Mew -	Stallman -	23	Fall of roof whilst getting bind to build the packs.	–	1	–	–	–	1
„ 3	23	No. 2, Clay Cross	Clay Cross -	Clay Cross Iron and Coal Co.	William Shuffle-bottom.	Ditto -	39	Fall of roof. Deceased neglected to set sufficient timber to secure his working place.	–	1	–	–	–	1
„ 15	24	Birley West Pit -	Sheffield - -	Jeffcock, Dunn, & Co. -	Allen Moorcroft -	Driver -	15	Riding on coupling chains, between the horse and the tubs. Horse suddenly stopped and the tubs crushed the deceased.	–	–	–	1	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts	Miscellaneous.	Above ground.	Total.
1878.														
July 20	25	New Hollingwood	Staveley - -	Staveley Iron and Coal Co.	Jonathan Piggford	Sinker -	42	Adjusting steam pipes in the shaft when they gave way.	–	–	1	–	–	1
					Thomas Mason -	Ditto -	32		–	–	1	–	–	1
					Edward Holmes -	Chargeman	51		–	–	1	–	–	1
					James Marrion -	Sinker -	25		–	–	1	–	–	1
Aug. 27	26	Newcastle - -	Nottingham -	C. Seely & Co. - -	Thomas Holyhead	Stallman -	40	Fall of coal. Knocking out holing sprags.	–	1	–	–	–	1
Sept. 12	27	Tibshelf - -	Alfreton - -	C. Seely & Co. - -	John George Coupe	Banksman -	19	Knocked down by a railway truck and run over.	–	–	–	–	1	1
„ 12	28	Barlboro - -	Staveley - -	Staveley Iron and Coal Co.	Henry Bone -	Screenman	43	Coupling the slack wagon to the incline chain when the engine started and crushed him against a post.	–	–	–	–	1	1
„ 17	29	Hawkesbury -	Coventry -	Hawkesbury Colliery Co.	Henry Deeming -	Miner -	30	Travelling up engine plane, run over by water tubs.	–	–	–	1	–	1
„ 22	30	Oakwell - -	Ilkeston - -	Ilkeston Colliery Co. -	Joseph Cowley -	Stallman -	30	Taking out timber at the gate end when the roof fell upon him.	–	1	–	–	–	1
„ 27	31	Bestwood -	Nottingham -	Bestwood Iron and Coal Co.	John Smith - -	Driver -	17	Supposed to have been riding on a full tub; found dead under the tub.	–	–	–	1	–	1
Oct. 23	32	Hawkesbury -	Coventry -	Hawkesbury Colliery Co.	Joseph Priest -	Incline man	16	Coupling chains broke when the full tubs were going up the incline and the drag failed to act.	–	–	–	1	–	1
„ 28	33	South Leicestershire.	Coalville -	South Leicestershire Colliery Co.	Reuben Thompson	Door boy -	12	Left his door to practice driving and was run over by the loaded tubs.	–	–	–	1	–	1
„ 30	34	Manners - -	Ilkeston - -	Manners Colliery Co.	Herbert Collumbine	Holer -	16	Fall of coals whilst holing near a fault.	–	1	–	–	–	1
„ 31	35	Wyken - -	Coventry -	Wyken Colliery Co. -	Daniel Marsden -	Stallman -	27	Fall of coals whilst taking out the holing sprags previous to firing a shot.	–	1	–	–	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878.														
Oct. 31	36	Blackwell A. -	Alfreton - -	Blackwell Colliery Co. -	Isaac Jones -	Stallman -	37	Fall of roof. Stallman had neglected to set the timber as he took away the coals.	–	1	–	–	–	1
					James Priestman -	Loader -	20		–	1	–	–	–	1
Nov. 6	37	Newstead -	Nottingham -	Newstead Colliery Co. -	Benjamin Woollaton.	Datler -	35	Fall of roof whilst taking out the timber.	–	1	–	–	–	1
„ 12	38	Waingroves -	Ripley - -	Butterley Iron and Coal Co.	Richard Clark -	Stallman -	38	Fall of roof - - -	–	1	–	–	–	1
„ 16	39	Brands - -	Ditto -	Butterley Iron and Coal Co.	Walter Phillips -	Banksman -	19	Attending an hoist when the chain broke, the deceased being under at the time.	–	–	–	–	1	1
„ 16	40	No. 2, Hucknall -	Hucknall Torkard	Ellis and Co. - -	Joseph Chadburn -	Stallman -	35	Getting down over coal in the waste when the roof fell upon him.	–	1	–	–	–	1
„ 19	41	Plumbley -	Eckington -	John Rhodes and Son -	John Cain - -	Coke burner	24	Crushed by railway waggons -	–	–	–	–	1	1
„ 19	42	Digby - -	Nottingham -	Digby Coal Co. - -	William Down -	Banksman -	45	Deceased fell down the shaft with a full tub, supposed to have pushed it under the fencing which was only one bar.	–	–	1	–	–	1
„ 20	43	Langwith - -	Langwith -	Sheepbridge Iron and Coal Co.	Charles Cooper -	Stallman -	42	Killed whilst holing coals -	–	1	–	–	–	1
„ 21	44	Teversall - -	Mansfield -	Stanton Iron Co. -	John Renshaw -	Pony driver	16	Boy riding upon the horses shafts with a train of loaded tubs—run over.	–	–	–	1	–	1
Dec. 1	45	Stanton -	Burton-on-Trent	Nadin and Son - -	Thomas Edwards -	Stallman -	36	Fall of coals whilst setting sprags	–	1	–	–	–	1
„ 16	46	Tibshelf - -	Alfreton - -	C. Seeley and Co. - -	Stephen Searston -	Loader -	19	Stallman fired a shot within four yards of the deceased whilst he was loading coals.	–	1	–	–	–	1
„ 16	47	Birley West Pit -	Sheffield - -	Jeffcock, Dunn, and Co. -	John Bradshaw -	Collier -	42	Getting down roof when it suddenly fell.	–	1	–	–	–	1
„ 23	48	Gresley - -	Burton-on-Trent	C. F. Abney Hastings -	Samuel Kilby -	Loader -	23	Loading in front of overhanging coals; sprags had been accidentally loosened.	–	1	–	–	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death and Remarks.	No. of Lives lost in Coal Mines. Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878. Dec. 26	49	Langton - -	Alfreton - -	Coke and Co. - -	George Sheppard -	Collier -	47	Crossing the bottom of the shaft. Cage descended upon him.	–	–	1	–	–	1
								Total - - -	–	31	11	8	5	55
								In and about ironstone and clay mines - - -						–
								Deaths in and about collieries - - - - -						55
								Number of separate accidents - - - -						49

	Deaths.
January - - - - -	10
February - - - - -	0
March - - - - -	6
April - - - - -	2
May - - - - -	3
June - - - - -	2
July - - - - -	7
August - - - - -	1
September - - - - -	5
October - - - - -	6
November - - - - -	8
December - - - - -	5
Total lives lost - - -	55

To the Right Hon.
R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State.

I have, &c.
THOMAS EVANS,
31st March 1879.

Mr. Evans' Report.

Report on the working of the Metalliferous Mines Act of 1872, 35 & 36 Vict. cap. 77., by Thomas Evans, Esq., F.G.S.

Sir, Pen-y-Bryn, Derby, 31st March 1879.

In obedience with the provisions of the Metalliferous Mines Act of 1872 (section 20), I have the honour to submit for your consideration a report on the working of this Act of Parliament so far as relates to this district, the Midland Counties.

Derbyshire and Nottinghamshire are the only counties under my inspection in which at present metalliferous ores are being worked underground.

In the latter county gypsum alone is produced—mostly from Newark to the Trent; and in Derbyshire from the Trent westward towards the town of Derby.

In both counties the total quantity raised is about 72,000 tons; it is used in the manufacture of paint, paper, plaster of paris, and in the ornamental parts of the interior of buildings.

The ores wrought in Derbyshire, especially in the northern part of the county, the High Peak, the wapentake of Wirksworth and Crich, are varied and considerable in quantity; amongst them are lead, calc-spar, limestone, barytes, manganese, fluor-spar, ochre, and zinc; the production of lead being much in excess of any of the others, of course, excepting the gypsum.

There has not been a single fatal accident during the year.

The descending and ascending the mines by means of ladders is very laborious, and occupies time. I hope in some of the larger mines the owners will see the advantage in adopting such machinery as that used in the coal mines; indeed in one case the proprietor has decided to do so at once, and probably others will follow his example.

The machinery generally is very primitive, much as it was in the last century.

There has been an enormous amount of trouble and time spent in getting together anything like correct statistics; in many cases it was necessary to make special visits to the mines, and they are for the most part long distances from the nearest railway stations. The Act of Parliament enacts that when more than 12 persons are employed, the owner shall make the necessary return to the Inspector of Mines, on behalf of the Secretary of State; but in Derbyshire the greater part of the mines are those at which only three or four persons work at the same time. With these the barmaster makes the return; but he has nothing to do with minerals other than lead ore; and it is these numerous small places that have to be looked up for the return of various minerals and the number of persons employed; and it is only by constant travelling about the High Peak and the other parts of the district, and by searching inquiries, they can be found or heard of.

In this report I have, as in past years, given the separate quantity of minerals wrought at each separate mine. The inspectors having the trouble in collecting these returns and obtaining the information, it is right the mining community should know how the statistics of the country are compiled.

As soon as the proof of my report containing the statistics is corrected, I will, in obedience with your instructions, send the return forms filled up to the Home Office, so as to enable a copy to be taken for the Mining Records.

Mr. A. H. Stokes, of Derby, is still my assistant. He has performed the duties of his office most satisfactorily; and in my report on the Coal Mines Regulation Act, an analysis of the work done is fully given, and requires no comment.

I have, &c.,
THOMAS EVANS,
H.M.'s Inspector of Metalliferous Mines.

To the Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Whitehall, London.

SUMMARY of MINING PRODUCE in the Midland District in the year 1878.—(Metalliferous Mines.)

Situation of Mines.	Kind of Mining Produce.	Tons.	Cwt.	Qrs.	Lbs.
Derbyshire	Gypsum	72,220	—	—	—
	Lead	7,079	15	1	15
	Chert	3,997	—	—	—
	Calc-spar	3,181	14	3	—
	Limestone	2,864	—	—	—
	Barytes	2,385	15	—	—
	Manganese	192	—	—	—
	Fluor-spar	244	12	2	—
	Ochre	32	12	—	—
	Calamine (zinc ore)	—	—	—	—
	Total	92,197	9	2	15

NOTE.—Part of the Gypsum is raised in Nottinghamshire.

LIST of MINES classed under The Metalliferous Mines Regulation Act, in MR. THOMAS EVANS' District, 1878.

Owner or Company, and Postal Address.	Mineral worked.	Quantity. Tons.	Cwt.	Qrs.	Name of Mine.	Where situated.	Barmaster.
Alport Mining Company, near Bakewell	Lead	4	15	—	Lee Whall	Harthill, nr. Allport	John Wagstaffe.
	Lead				Wheels Rake		
	Barytes	54	—	—	Hard Work		
					Calc-spar		
Allsop, Thomas, Wardlow	Ditto	—	—	—	Castcliff	Wardlow	Isaac Shimwell.
Allsebrook, William, Tissington	Ochre	6	12	—	Nancy	Tissington, Ashbourne	A. M. Alsop.
	Lead	—	—	—			
	Ditto	—	—	—	Speedwell		
	Ditto	—	—	—	Plantation		
	Barytes	28	—	—			
Allen, William, Taddington (Flagg viâ Buxton).	Lead	3	13	3	Killhill Rake	Flagg, Buxton.	Isaac Shimwell.
Ashton, Robert How, Castleton	Ditto	2	10	—	Mossrakehead	Bradwell	
	Ditto	50	10	—	Hugh Grove	Ditto	
	Ditto	1	3	2	Moor Cock	Ditto	
	Ditto	1	4	3	Holland Twine	Castleton	
	Ditto	2	16	2	New York	Peak Forest	
	Ditto	14	8	—	Seedlow	Ashford Longstone.	
	Ditto	—	19	3	Stand-to-thyself	—	
	Ditto	32	—	—	Pindale	Castleton	
	Ditto	—	13	1	Two Rakes	—	
Bacon, John, Youlgreave	Ditto	—	—	—	Fisherman	Youlgreave	John Wagstaffe.
Bacon, James, Youlgreave	Ditto	—	—	—	Moor Close		
	Calc-spar	100	—	—			
Backdale Mining Company, Hassop	Lead	27	2	1	Backdale	Hassop	William Bland, Eyam, Agent.
	Calc-spar	400	—	—			
Barker, Luke, and Company, Eyam.	Lead	38	10	—	White Coe	Hassop Common.	Geo. Taylor.
Bagshaw, Benjamin, Eyam	Ditto	26	14	—	Black Engine	Eyam	Isaac Shimwell.
Bagshaw, W. B., Litton	Ditto	—	—	—	Cross Lands	Near Litton	W. B. Bagshaw, Agent.
Batterley, William, Brassington.	Ditto	—	15	—	Waterholes	Carsington	A. M. Alsop.
Belper, Lord	Gypsum	—	—	—	Westleake	Kegworth	J. W. Fearn, Agent.
Bembridge, Saml., and Co., Hipley Toll Bar, Brassington.	Lead	—	—	—	Cat Holes	Brassington	A. M. Alsop.
Boam, John, Winster	Ditto	3	—	—	Heyspots	Elton.	
	Manganese	—	—	—			
Bradwell, Joseph, Bradwell	Lead	—	13	1	Providence	Peak Forest Liberty.	Isaac Shimwell.
Bradwell, Thomas, Bradwell	Ditto	4	9	3	Smith Grove	Castleton Liberty.	
	Ditto	28	—	—	Dirtlow		
	Ditto	12	11	3	Ashton Grove		
	Ditto	—	—	—	Nethershuttle Rake		

Owner or Company, and Postal Address.	Mineral worked.	Quantity. Tons.	Cwt.	Qrs.	Name of Mine.	Where situated.	Barmaster.
Bradley, William, Bonsall	Lead	2	10	–	Yield	Bonsall	A. M. Alsop.
Brooks, Thomas, Middleton by Wirksworth.	Ditto	–	–	–	Providence	Middleton, Wirksworth.	
Brooks, Samuel, Middleton, Wirksworth.	Ditto	–	–	–	Ash Tree, No. 1	Cromford	
	Ditto	–	15	–	,, No. 2	Middleton	
	Ditto	–	–	–	Potosi	Ible	
Brooks, Edward, Middleton, Wirksworth.	Ditto	–	–	–	Merry Tom	Middleton	
Birch and Ryde, Chellaston	Gypsum	4820	–	–	Chellaston	Chellaston.	
Bonsall, William, Monyash	Lead	1	3	3	Turnip Close	Monyash.	
Burrows, George, Smalldale, Bradwell.	Ditto	–	–	–	New Venture	Bradwell	Isaac Shimwell.
Bridden, Thomas, Brassington.	Barytes	22	–	–	White Lion Tor		
	Lead	–	–	–	Standhills	Brassington	A. M. Alsop.
Buckley, James, Middleton	Ditto	–	–	–	Dalefields	Wirksworth	
	Barytes	7	–	–			
Brickhill, Matthew, and Co., Foolow, Eyam	Lead	–	16	–	South Pipe	Stoney Middleton.	Matthew Brickhill, Agent.
	Barytes	118	–	–			
Broadbend, George, Castleton	Lead	–	16	1	Wrangling Rake	Castleton	G. Broadbend, Agent.
	Barytes	90	–	–			
Buckley, Henry, Matlock	Lead	–	–	–	Wrangling Well	Matlock	A. M. Alsop.
Buckley, William, Middleton	Ditto	–	4	2	Buckleys Venture	Middleton.	
Buckley, Benjamin, Rise End, Middleton, Wirksworth	Ditto	–	–	–	Bellharp	Buxton	Isaac Shimwell.
	Ditto	–	6	–	Kitchen Vein		
	Ditto	5	–	–	Sparklow	Hurdlow	
Buckley, Joseph, Wirksworth.	Ditto	–	3	–	Little Shays		
Buxton, Charles, and others, Middleton, Youlgreave.	Ditto	9	–	–	Long Rake	Middleton	A. M. Alsop.
Britland, John, Cromford	Ditto	–	–	–	Ashcross	Cromford	
Bunting, William, Ball Eye, Bonsall	Ditto	–	–	–	Buntings Scrin	Bonsall	
	Ochre	–	–	–	Ditto		
Bunting, Benjamin, Matlock, Bath	Lead	–	–	–	Chance		
	Ditto	–	8	–	Coalpit Rake		
	Ditto	–	17	–	Brunt		
Bunting, Wesley, Bonsall	Ditto	1	12	–	Horsedale		
Bunting, Job, Bonsall	Ditto	–	–	–	Tule Loaf		
Burton, Joseph, Bonsall Moor, Winster	Ditto	–	–	–	Longden Shaft	Bonsall Moor	
	Barytes	–	–	–			
Cheetham, John, Bradwell	Lead	–	–	–	Long Rake	Bradwell	Isaac Shimwell.
	Barytes	–	–	–	Ditto		
Cooke, W. G., and Co., Youlgreave	Lead	3	–	–	Ditto	Youlgreave	John Wagstaffe.
	Calc-spar	587	14	3	Ditto		
Cotterill, Robert, Bonsall	Barytes	21	10	–	Lark House	Cromford	A. M. Alsop.
Davis, T., Cross Dale Head, Longstone.	Ditto	–	–	–	Cross Dale Head	Longstone	Isaac Shimwell.
Denny and Co., Hubberdale, Chelmerton.	–	–	–	–	Hubberdale	Taddington	
Doxey, Francis, Middleton, Wirksworth	Lead	6	4	–	Griff Bage	Hopton	Thomas Taylor.
	Barytes	10	–	–			
Doxey, Anthony, Middleton, Wirksworth.	Lead	–	–	–	Cauk	Middleton	A. M. Alsop.
Doxey, Jacob Middleton, Wirksworth.	Ditto	–	4	–	Goodluck		
Doxey, John, Middleton, Wirksworth.	Ditto	1	–	–	New Butts	Cromford	
Elliott, George, Bradwell	Barytes	–	–	–	Spring Flat	Bradwell	Thomas Furniss.
Elliott, Ernest, Smalldale, Bradwell.	Lead	–	–	–	Nunley End	Ditto	Isaac Shimwell.
Ellis, John, and Son, Leicester.	Limestone	3345	–	–	Barrow-on-Soar	Sileby, Loughboro'.	John Ellis, Agent.
Evans, Joseph Middleton, Wirksworth	Lead	–	–	–	Calton Hill Side	Youlgreave	John Wagstaffe.
	Ditto	–	15	–	Fowslow Wells	Griff Grange	Thomas Taylor.
Eyre, Jacob, Castleton	Ditto	–	–	–	Royal Rose	Peak Forest Liberty	Isaac Shimwell.
	Barytes	–	–	–			

Owner or Company, and Postal Address.	Mineral worked.	Quantity. Tons.	Cwt.	Qrs.	Name of Mine.	Where situated.	Barmaster.
Eyam Mining Company, Eyam	Lead	198	8	2	Eyam Mines	Eyam	Charles Nodder, Agent.
	Calc-spar	15	10	–			
	Fluor-spar	–	–	–			
Eyre, H. V., Castleton	Ditto	2	19	2	Blue John Caverns	Castleton	H. V. Eyre, Agent.
	Calc-spar	–	–	–			
Fairburn, John, and Co., Longstone	Lead	–	–	–	Magpie	Sheldon Bakewell.	Isaac Shimwell.
	Ditto	–	–	–	Longstone Edge	Longstone	
	Ditto	–	–	–	Salad Hole	Stoney Middleton.	
	Barytes	–	–	–			
Fearn, John, Brassington	Lead	2	–	–	Bald Meer		
Fox, John, and Company, Bradwell.	Ditto	6	16	2	Outland Head	Bradwell	
Froggatt, William, Cressbrook, Ashford	Ditto	10	1	1	Putty Hill	Monsall Dale	
	Barytes	22	–	–			
	Calc-spar	826	–	–			
Frost, Isaac, Youlgreave	Lead	–	–	–	The Ashes	Youlgreave	John Wagstaffe.
	Barytes	–	–	–			
Furniss, William and Anthony, Ashford, Longstone	Lead	1	7	3	Cackle Mackle	Great Longstone.	Isaac Shimwell.
	Barytes	67	–	–			
Furniss, Abraham, Pindale, Castleton	Lead	5	14	1	How Grove, Dirtlow.	Castleton	
	Barytes	186	–	–			
	Calc-spar	–	–	–			
Furniss, William, Eyam	Lead	1	13	2	Seedlow	Stoney Middleton.	
Furniss, Richard and James, Eyam.	Ditto	12	10	3	Watersaw	Longstone	
Garton, E. H., Snitterton, Matlock.	Ditto	–	–	–	White Hillocks	Snitterton	A. M. Alsop.
Garratt, William, and others, Allport, Bakewell	Ditto	9	–	–	Wheals Rake	Haddon	John Wagstaffe.
	Barytes	37	–	–			
Garratt, Joseph, Middleton, Youlgreave.	Lead	1	12	–	Long Rake	Middleton, Youlgreave.	A. M. Alsop.
Goodwin, John, Ashford	Ditto	–	–	–	Black Sheep	Ashford	Isaac Shimwell.
Goodwin, George, Monyash.	Ditto	15	–	–	Cabins	Newhaven	
	Ditto	–	8	–	Starlight		
Goodacre Bros., Gotham, Kegworth.	Gypsum	5286	–	–	Pepper	Gotham	Charles Goodacre, Agent.
Goodwin, John, Monyash	Lead	14	18	–	Hard Rake	Near Sheldon, Ashford.	Isaac Shimwell.
	Barytes	57	–	–			
	Calc-spar	1030	–	–			
	Calamine	–	–	–			
Gould, John, Senr., Brassington	Lead	5	10	–	Roundlow	Brassington	A. M. Alsop.
	Barytes	10	–	–			
	Ditto	–	–	–	Longcliff		
Gould, John, Junr., Brassington.	Ditto	–	–	–	Bee Nest		
Great Rake Mining Company, Brassington.	Ditto	–	–	–	Great Rake		
Gratton, Francis, Upper Town, Bonsall.	Ditto	–	–	–	Ball Eye	Bonsall	
Gretrex, Joseph, Brassington.	Ditto	–	–	–			
Griff Bage Mining Company, Hopton, Wirksworth.	Lead and barytes.	–	–	–	Upper Griff Bage	Hopton	Thomas Taylor.
Green, H., and Co.	Gypsum	2376	–	–	Barton	Barton	
Gratton, James, Wirksworth	Lead	1	1	–	Friths Scrin		
Gratton, Francis	Barytes	4	–	–	Ball Eye	Bonsall	
	Calc-spar	12	–	–			
Harward, Arthur, Wirksworth.	Lead	16	10	–	Quarry Vein	Wirksworth	

Owner or Company, and Postal Address.	Mineral worked.	Quantity. Tons.	Cwt.	Qrs.	Name of Mine.	Where situated.	Barmaster.
Hadfield, Bros., Castleton	Lead	–	–	–	Freezeland	Castleton	Isaac Shimwell.
	Barytes	–	–	–	Freezeland	Castleton	Isaac Shimwell.
Hall, Joseph, solicitor, Castleton	Ditto	268	15	–	Bullock Grove	Castleton	Isaac Shimwell.
	Lead	–	3	–	Bullock Grove	Castleton	Isaac Shimwell.
	Ditto	1	2	–	Eldon Bent	Castleton	Isaac Shimwell.
	Ditto	1	4	2	Hazard	Castleton	Isaac Shimwell.
	Ditto	4	3	1	Penny Mine	Castleton	Isaac Shimwell.
	Ditto	–	5	1	Long Rake Bottom	Castleton	Isaac Shimwell.
Hall, Joseph, miner, Castleton	Ditto	–	–	–	Kirk Grove	Castleton	Isaac Shimwell.
	Ditto	–	–	–	Portaway	Castleton	Isaac Shimwell.
	Ditto	4	–	–	Holland Twine	Castleton	Isaac Shimwell.
	Barytes	40	–	–	Holland Twine	Castleton	Isaac Shimwell.
Hall, Isaac, and Company, Castleton	Lead	–	–	–	Hit or Miss	Peak Forest Liberty.	Isaac Shimwell.
	Ditto	2	–	2	Clear-the-way	– – –	Isaac Shimwell.
Hall, Isaac, Bradwell	Ditto	–	7	1	Oxlow	– – –	Isaac Shimwell.
	Barytes	106	–	–	Oxlow	– – –	Isaac Shimwell.
	Lead	6	17	1	Sykes Engine	Bradwell	Isaac Shimwell.
Hall, John, Bradwell	Ditto	–	–	–	Hills Venture	Bradwell	Isaac Shimwell.
Hallam, Thomas, Bradwell	Ditto	1	5	–	Windy	Bradwell	Isaac Shimwell.
	Ditto	1	5	3	Hungry Knowle	Bradwell	Isaac Shimwell.
	Ditto	–	8	1	New Rake	Bradwell	Isaac Shimwell.
Hallam, John, and Co., Bradwell.	Ditto	–	–	–	Bennett's Grove	Bradwell	Isaac Shimwell.
Harbro Rake Mining Co., Brassington.	Ditto	–	8	–	Harbro Rake.		
Hartington Moor Mining Company.	Ditto	16	10	–	Discovery	Newhaven	H. Toft, Agent
	Ochre	7	–	–	Discovery	Newhaven	H. Toft, Agent
	Lead	4	–	–	Bell Harp	Newhaven	H. Toft, Agent
Hill, Thomas, Peak Forest	Ditto	1	2	–	New York, Cap-round	Bradwell	Isaac Shimwell.
	Barytes	200	–	–	New York, Cap-round	Bradwell	Isaac Shimwell.
Higinbotham, G. W., Cadster, Whaley Bridge.	Lead	–	19	3	Birch Hill	Peak Forest Liberty.	Isaac Shimwell.
Holmes, Edward, Cromford	Ditto	–	–	–	Sweetner	Cromford	A. M. Alsop.
Holmes, Daniel, Middleton, Wirksworth.	Ditto	1	–	–	Chance	Cromford	A. M. Alsop.
Holmes, Samuel, Middleton	Ditto	1	2	–	Primrose	Bonsall.	
Holmes, Anthony, Kelstedge, Ashover.	Ditto	4	10	–	Mill Town	Ashover.	
	Fluor-spar	50	–	–	Mill Town	Ashover.	
Horribon and Co., Alport	Ditto	–	–	–	Bowers Rake	Haddon	John Wagstaffe.
	Barytes	–	–	–	Bowers Rake	Haddon	John Wagstaffe.
Hoskin, Samuel, Winster	Lead	2	–	–	Long Tor.		
Harrison, John, Sheldon	Ditto	–	10	–	High Stool Pipe.		
Hubbodale Mining Co., Chelmerton.	Ditto	–	–	–	Hubbodale.		
Jeffery, Ellis, Bradwell	Ditto	3	12	3	Hills Venture.		
Jeffery, Joshua, and Co., Bradwell	Ditto	3	10	1	Brunt	Bradwell	Isaac Shimwell.
	Ditto	7	3	1	Bird	Bradwell Moor.	Isaac Shimwell.
Johnson, William, Parwich	Ditto	–	–	–	General Wolfe	Parwich	A. M. Alsop.
Johnson, George, Youlgreave, Bakewell	Ditto	2	–	–	Meadow Rake	Youlgreave	John Wagstaffe.
	Ochre	19	–	–	Meadow Rake	Youlgreave	John Wagstaffe.
Marshall, Alfred, Elton	Lead	4	10	–	Gorrist.		
Marshall, A., Stone and Taylor, Elton.	Manganese	10	–	–	Blakelowfield	Elton	A. M. Alsop.
Marshall, John, Elton	Ditto	–	–	–	Blakelowfield	Elton	A. M. Alsop.
	Manganese	10	–	–	Blakelowfield	Elton	A. M. Alsop.
Mather, Samuel, Middleton, Wirksworth.	Lead	–	10	–	Springhurst	Middleton	A. M. Alsop.
Mawston Mining Company, Alport, Bakewell	Barytes	2	–	–	Wendley Hill	Youlgreave	A. M. Alsop.
	Lead	8	15	–	Wendley Hill	Youlgreave	A. M. Alsop.
Middleton, Joseph, Bradwell	Ditto	–	–	–	Longdon	Bradwell	Isaac Shimwell.
	Lead	–	–	–	Upper Top	Bradwell	Isaac Shimwell.
	Barytes	–	–	–	Upper Top	Bradwell	Isaac Shimwell.
Middleton, John, Smalldale, Bradwell	Lead	–	–	–	New Pasture	Bradwell	Isaac Shimwell.
	Ditto	–	3	2	Woodcock	Bradwell	Isaac Shimwell.
Middleton, Allen, Bradwell	Ditto	9	7	2	Royal Oak	Bradwell	Isaac Shimwell.
Middleton, Charles	Ditto	–	–	–	Royal Oak	Bradwell	Isaac Shimwell.
Middleton, Robert, Bradwell.	Ditto	–	–	–	Dalebottom	Bradwell	Isaac Shimwell.
Millington, John, Monyash	Limestone	–	–	–	Ricklowdale	Monyash	Isaac Shimwell.

Owner or Company, and Postal Address.	Mineral worked.	Quantity. Tons.	Cwt.	Qrs.	Name of Mine.	Where situated.	Barmaster.
Mill Dam Mining Company, Great Hucklow, Eyam	Lead	1299	10	3	Mill Dam	Great Hucklow.	Leonard Maltby, Agent.
	Ditto	4	3	–	Silence		
Moore, John, Middleton, Wirksworth.	Ditto	–	–	–	Swifts Scrin	Middleton	A. M. Alsop.
Morton, Jabez, Bradwell	Barytes	4	–	–	Windy Knowle	Bradwell	Isaac Shimwell.
	Lead	3	14	2			
Morton, Thomas, Bradwell	Ditto	–	–	–	Ripper		
Mossrake Mining Company, Bradwell.	Ditto	–	–	–	Southfield		
Morton, Fred, Bradwell	Ditto	–	9	1	Ripper.		
Mycock, William, Flagg, Buxton.	Ditto	–	7	3	Dogleg.		
Needham, Thomas, Allport, Bakewell.	Ditto	–	–	–	Open Rake		John Wagstaffe.
Nutthall, William, Youlgreave.	Lead	–	–	–	Puncheon Sides	Youlgreave	John Wagstaffe.
Nutthall, Samuel, Youlgreave.	Ditto	–	–	–	Out Rake		
Nunley End Mining Company.	Ditto	–	–	–	Nunley End.		
Norcliff Sough Co., Calver	Ditto	4	7	–	Norcliffe Sough	Calver	William Bland, Eyam, Agent.
	Calc-spar	15	–	–			
Oliver, Robert, Rowland, Bakewell.	Lead	4	17	2	Small Rake	Longstone	Isaac Shimwell.
	Ditto	1	1	3	Edge Side		
Oliver, Martin, Great Longstone.	Ditto	1	1	3	Wide Rake		
Palfreyman, Geo., Bradwell	Lead	–	9	3	Upper Bank Top	Smalldale	Isaac Shimwell.
Parker, T. J., and Co., Stoney Middleton.	Ditto	–	–	–	Farnley Rake	Stoney Middleton.	Isaac Shimwell.
Pearson, Norman, Bonsall	Ditto	–	–	–	Needhams Venture	Bonsall	A. M. Alsop.
Pegg, Harper, and Company, Derwent Mills, Derby	Gypsum	6581	–	–	Aston Glebe	Aston, near Derby.	Charles Foreman, Agent.
	Ditto	6000	–	–	Aston Home		Ralph Foreman, Agent.
Pett, Isaac, Biggin, Hartington.	Lead	–	–	–	Green Rake	Biggin, Hartington.	Isaac Shimwell.
Peak Forest Mining Company, Chapel-en-le-Frith.	Ditto	520	–	–	Sparrow Pit	Chapel-en-le-Frith.	
Rakehead Mining Co., Bradwell.	Ditto	50	10	–	Rake Head	Bradwell	
Redfern, Francis, Foolow Eyam	Ditto	6	7	2	White Rake	Tideswell	Isaac Shimwell.
	Ditto	17	19	1	Tideslow		
	Ditto	18	3	–	Valentine	Little Hucklow.	
Repton, Joseph, Carsington	Ditto	–	–	–			
Repton, Joshua, Carsington	Ditto	–	–	–	Flaxpiece	Peak Forest	Isaac Shimwell.
	Ditto	–	12	–	Breck Hollow	Brassington	A. M. Alsop.
	Barytes	–	–	–			
	Limestone	–	–	–			
Repton, John and Joseph, Hopton, Wirksworth.	Lead	–	–	–	Old Knowle	Hopton	Thomas Taylor.
Royse, Ellen, Castleton	Barytes	40	–	–	Smiling Nancy	Castleton	Isaac Shimwell.
	Lead	–	–	–	Rush		
	Ditto	–	9	3			
Robinson, John, Wardlow	Ditto	–	–	–	Stratford	Longstone	
	Barytes	10	–	–			
Robey and Co., Thrumpton, near Kegworth.	Gypsum	14,000	–	–	Thrumpton Mines	Thrumpton Kegworth.	Robert Robey, Manager.
Seedlow Mining Company, Eyam.	Lead	14	15	–	Seedlow	Eyam	Isaac Shimwell.
Sellers, Jonathan, Foolow	Ditto	–	18	2	Seedlow, East.		
Sellers, John, and Co., Wardlow, Litton	Barytes	–	–	–	Slack Scrin and Stratford.	Ashford Liberty.	
	Lead	3	3	3			
	Barytes	160	–	–			

Owner or Company, and Postal Address.	Mineral worked.	Quantity. Tons.	Cwt.	Qrs.	Name of Mine.	Where situated.	Barmaster.
Sheldon, Samuel Middleton, Wirksworth.	Lead	5	–	–	Snake	Middleton	A. M. Alsop.
Shimwell, Joseph, Youlgreave.	Calc-spar	100	–	–	Long Rake.		
Shuttleworth, J. S. A., Hathersage	Lead	38	7	1	Broadlow.		
	Ditto	52	18	1	Little Pastures	Eyam	Isaac Shimwell.
	Fluor-spar	5	19	2			
	Lead	39	2	2	New Edge	Great Hucklow.	
	Ditto	3	–	–	Mogshaw.		
Smith, Joseph, Bakewell	Barytes	42	–	–			
Smith, Joseph, and Son, Bakewell.	Chert	3997	–	–	Chert Mine	Bakewell	— Noton, Manager.
Spencer, Charles, Middleton.	Lead	–	–	–	Conway	Brassington	A. M. Alsop.
Spencer, John, and Co., Middleton, Wirksworth.	Ditto	–	–	–	Croft Doghole	Middleton	
Spencer, John, Wirksworth	Ditto	–	–	–	Rantor Takers		
Spencer, Thomas, Middleton, Wirksworth.	Ditto	–	–	–	Back Settlements		
Spencer, James, Middleton, Wirksworth.	Ditto	–	13	3	Sunny Side	Hopton	Thomas Taylor.
Spencer, Benjn., Middleton, Wirksworth.	Ditto	–	5	–	Ash Tree	Middleton	A. M. Alsop.
Stocker and Adames, Gotham, Kegworth.	Gypsum	6200	–	–	Weldon	Gotham	— Adams, Agent.
Stone, Geo., and Co., Elton, Wirster.	Manganese	20	–	–	Sweep	Elton	A. M. Alsop.
Street, William, Wirksworth.	Lead	11	10	–	Old Gells	Middleton	
Standhills Mining Company, Brodbourn, Brassington.	Ditto	5	–	–	Standhills	Brassington	
Stevens, John, and Son, Aston-on-Trent, Derby.	Gypsum	3505	–	–	Aston	Aston-on-Trent.	J. P. Stevens, Agent.
Stableford, Thos., Chellaston.	Ditto	–	–	–	Chellaston	Chellaston.	
Taylor, Henry, Carsington	Lead	–	–	–	Hazard	Carsington	A. M. Alsop.
Taylor, Cornelius, and Co., Great Longstone.	Ditto	2	8	1	Water Holes	Hassop	Geo. Taylor.
Thomlinson and Salkeld, Gotham, Kegworth.	Gypsum	3478	–	–	Gotham Glebe	Gotham	James Fox, Agent.
Toft, Henry, Allport, near Bakewell.	Lead	–	–	–	Cobbler Vein	Haddon	John Wagstaffe.
Towndrow, Edward, Mill Town, Ashover.	Fluor-spar	120	–	–	Mill Town	Ashover.	
	Lead	–	10	–			
Turner, William, and Co., Watergrove, Eyam.	Ditto	–	–	–	South Pipe	Stoney Middleton	Isaac Shimwell.
	Barytes	50	–	–			
	Lead	–	–	–	Burnt Heath		
Twigg, Joseph, Ashford	Black Marble	9	–	–	Marble Hole	Ashford	Joseph Twigg, Agent.
Tymm, Charles, Castleton	Barytes	10	–	–	Marsh Loggin	Peak Forest Liberty.	Isaac Shimwell.
Wass and Son, Lea Lead Works, Matlock	Lead	–	8	–	Coarse Hill.		
	Ditto	31	1	–	Upper Gollendine	Hopton	Thomas Taylor.
	Barytes	416	–	–			
	Lead	1	4	1	Eblows		
	Ditto	–	–	–	Swang	Carsington	A. M. Alsop.
	Ditto	–	–	–	Gorrist		
	Ditto	8	–	–	Bull Tor		
	Ditto	103	–	–	Brights Friendly	Wirksworth	
	Calc-spar	40	–	–			
	Limestone	276	–	–			
	Barytes	106	–	–	Longden Close.		
	Lead	–	10	–	Greenerfield.		
	Ditto	5	–	–	Rifle Butts.		
	Ditto	–	9	–	Cowdor Slack.		
	Fluor-spar	71	13	–	Barkerfield	Crich.	
	Lead	1	4	–	Greymare.		
	Ditto	3	4	–	Orchard.		

Owner or Company, and Postal Address.	Mineral worked.	Quantity. Tons.	Cwt.	Qrs.	Name of Mine.	Where situated.	Barmaster.
Wass and Son, Lea Lead Works, Matlock	Lead	7	10	–	Bradwell	Middleton, Wirksworth.	A. M. Alsop.
	Ditto	12	12	–	Gells Norcliff	- - -	
	Ditto	–	4	–	Tunnel veins	- - -	
	Ditto	–	–	–	Dunrake	Cromford	
	Ditto	–	–	–	Watch House	Griff Grange	Thomas Taylor.
	Ditto	–	–	–	Doxeys Engine	- - -	A. M. Alsop.
	Ditto	5	5	–	Jacksons	Middleton, Wirksworth.	
	Ditto	–	–	–	Hill Top		
	Ditto	–	–	–	Milken Bottom		
	Ditto	49	13	2	Moorhigh	Taddington	Isaac Shimwell.
	Ditto	–	–	–	Nightengale Leys	Wirksworth	A. M. Alsop.
	Ditto	–	–	–	Pingle	Middleton, Wirksworth.	
	Ditto	–	15	–	Malsters Venture	- - -	
	Ditto	11	10	–	Hardbeat	Elton	
	Ditto	–	–	–	Ratchwood	Wirksworth	
	Ditto	–	–	–	Rose in June	Cromford	
	Ditto	–	–	–	Roguery	Wensley	
	Ditto	–	–	–	Stichen	Middleton, Wirksworth.	
	Ditto	–	–	–	Spar Rake		
	Ditto	–	–	–	Thumperstich		
	Ditto	–	–	–	Mount Pleasant	- - -	
	Ditto	–	–	–	Pitts	Winster	Isaac Shimwell.
	Ditto	–	–	–	Raithe	Elton	A. M. Alsop.
	Ditto	–	12	–	Moletrap	Matlock	
	Ditto	–	–	–	Elton Cross	Winster	Isaac Shimwell.
	Ditto	–	–	–	Hey Spots		
	Manganese	140	–	–			
	Lead	3346	–	–	Mill Close	Wensley	A. M. Alsop.
	Limestone	–	–	–			
	Lead	582	–	–	Wakebridge	Crich	
	Calc-spar	30	–	–			
	Fluor-spar	–	–	–			
	Limestone	150	–	–			
	Lead	197	–	–	Bage	Bole Hill, Wirksworth.	
	Calc-spar	41	–	–			
	Limestone	84	–	–			
	Lead	–	14	–	Golconda Nether	Griff Grange	Thomas Taylor.
	Barytes	79	–	–			
Warhurst, William, Chapel-en-le-Frith.	Lead	–	5	1	Deasy Rake.		
Wardle, Thomas, Youlgreave	Ditto	–	–	–	Town End	Youlgreave	John Wagstaffe.
	Barytes	2	–	–			
Ward, James, Poplar Street, Nottingham.	Gypsum	5716	–	–	Albert	Gotham	James Ward, Manager.
Wardman, W., Staley, Cromford.	Barytes	71	–	–			
Walker, Roger, Castleton	Lead	–	–	–	Eldon	Peak Forest	Isaac Shimwell.
	Barytes	–	–	–			
Walker, Robert, Wardlow	Lead	–	9	1	Scots Greys.		
Walton, William, Pike Hall, Brassington.	Ditto	–	–	–	Mouldridge	Brassington	A. M. Alsop.
Webster, George, Elton	Manganese	12	–	–	Inkerman	Elton	
Winser, E. F. and J., Gotham, Kegworth.	Gypsum	14,255	–	–	Nos. 1 and 2	Gotham	— Fox, Agent.
Wilson, Geo., Little Hucklow, Eyam	Lead	–	12	2	Chapmaiden	- - -	Isaac Shimwell.
	Ditto	–	11	–	Maiden Rake	Little Hucklow.	
	Barytes	30	–	–			
Winterbottom, Edward, Peak Forest.	Lead	–	10	1	Smiler	Peak Forest Liberty.	
Woodiwiss, Isaac, Bonsall	Ditto	–	–	–	Stubbin	Bonsall	A. M. Alsop.
Wortley, Francis, Harter Hill, Bonsall.	Ditto	–	–	–	Lower Gaskin	Bonsall Leys	

LIST of MINING LIBERTIES classed under the Metalliferous Mines Act, in the Derbyshire District, 1878.

Townships.	Owner of Mineral Duties.	Barmaster, &c.
Ashford Sheldon Great Longstone Little „ Wardlow Brushfield Blackwell Hartington Upper Hartington Nether „ Middle „ Peak Forest Tideswell Weston Winster Monyash Flag and Chelmorton Taddington Upper Haddon Castleton Bradwell Great Hucklow Little „	Duchy of Lancaster. Leased to the Duke of Devonshire.	Barmaster, Isaac Shimwell, Little Longstone, Bakewell. Deputy Barmasters, Robert How, Castleton; John Wagstaff, Winster, Bakewell; Thomas Shimwell, Little Longstone. Steward, C. S. B. Busby, Esq., Solicitor, Chesterfield.
Stony Middleton Eyam Foolow Eyam Woodlands	Duke of Devonshire, Duke of Buckingham and Chandos, and Sir Henry James Tufton.	Ditto.
Bakewell Nether Haddon Harthill Youlgreave Stanton Hazlebach Smerril Grange Aldwarke	Duke of Rutland.	John Wagstaffe.
Litton	Baron Scarsdale.	Thomas Furnace, Wardlow Miers, Tideswell.
Crich	Francis Hurt, Esq., and others.	
Hassop Calver Rowland	Col. Charles Leslie.	George Taylor, Hassop.
Grindlow	Mrs. Andrew Brittlebank.	F. Parker, Bank, Bakewell.
Griff	Exors. of Phillip Gells.	Thomas Taylor, Hopton, Wirksworth.
Part of Middleton	T. W. Bateman, Esq.	
Ashbourn Ballidon Bentley Bonsall Bradbourne Brassington Callow Carsington Cromford Dethick and Lea Eaton and Allsop Elton Hogmaston Hopton Ible Breton Wood Kirk Ireton Kniveton Mappleton Matlock Middleton and Smerril Middleton by Wirksworth Newton Grange Off Coate Underwood Parwich Tansley Thorpe Tissington Wensley Wirksworth	Duchy of Lancaster, Lessee, Exors. of Peter Arkwright, Esq.	Anthony M. Alsop, Wirksworth. Steward, Arthur Harward, Esq., Solicitor, Wirksworth.

LIST of the FATAL ACCIDENTS, and LOSS of LIFE arising therefrom, in the MIDLAND DISTRICT, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Mine.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Metalliferous Mines.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878.				No Fatal Accidents during the Year 1878 -				- - - - - -	–	–	–	–	–	–
								Total deaths -						–

No. 1.—SUMMARY of PERSONS EMPLOYED in and about the METALLIFEROUS MINES in the MIDLAND DISTRICT during the Year 1878.

Situation of Mines.	Underground.				Above-ground—Ages.							Total underground and above ground.
	Male Persons—Ages.				8 to 13.		13 to 18.		Above 18.		Total.	
	12 to 13.	13 to 16.	Above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.		
Derbyshire, Nottingham, and Leicestershire - - -	1	26	836	863	6	5	88	1	1	476	577	1,440

THOMAS EVANS,
Inspector of Metalliferous Mines.
31st March 1879.

Report of Assistant Inspector.

Sir, Derby, 24th March 1879.

In pursuance of section 48 of the Coal Mines Regulation Act, and section 20 of the Metalliferous Mines Regulation Act, 1872, I have the honour to report to you that during the past year I have exercised the duties of Inspector of Mines in the Derbyshire, Nottinghamshire, Leicestershire, Warwickshire, Northamptonshire, and Oxfordshire district, and that in so doing I have acted as assistant to and under the directions of Mr. Thomas Evans, the Chief Inspector for that district.

I have, &c.,
ARTHUR H. STOKES,

To the Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department, Whitehall.

Mr. Baker's Report

REPORT on the INSPECTION of MINES in the SOUTH STAFFORDSHIRE and WORCESTERSHIRE DISTRICT, for the Year ended the 31st of December 1878.—By JAMES P. BAKER, Esq.

SIR, Tettenhall, near Wolverhampton, 29th March 1879.

THE Report which I have the honour to lay before you for the past year, 1878, shows a large diminution in the number of persons killed in working the mines, classed under the Coal Mines Regulation Act of 1872, namely, coal, ironstone, and fireclay.

According to the returns 25,103 persons have been employed in these mines, of whom 50 lost their lives, which is not only 30 less than in the year previous, but by far the lowest number on record (except in 1874 the year of the great strike) when the number was exactly the same. The circumstances were, however, very different in the latter year as compared with 1878, as the strike rendered the pits idle for 16 weeks, otherwise the death-rate of that period would in all probability have been much higher.

This remarkable diminution is not by any means easy to account for, especially in the face of the coal, ironstone, and fireclay returns which have only fallen off about 500,000 tons. This spread over a district where the majority of the mines are small with a corresponding output has doubtless caused much irregularity in the time the workmen have been at their employment underground, which has thus kept them a considerable portion of the year out of the various dangers to which the miners are usually and constantly exposed. Taken in connexion with a reduction of 3,657 in the number of persons employed, this may to some extent account for the diminution in the number of lives lost.

Such results are always gratifying to record, but, desirable as they are, I fear they cannot be maintained, indeed there is nothing within the scope of my knowledge throughout the district to lead me to cherish a hope that such a desideratum can, at present, be achieved. Great as the changes and improvements have been within the last 20 years in this district, something still greater and more general must in my opinion be brought about before the present annual average death-rate in working the mines can undergo any very material permanent change. Seeing so marked a decrease in the record of lives lost during the year 1878, I considered it expedient, in order to render this report clear on the point, to make a few observations in relation thereto, so that the hopes as to the future may not be too sanguine, as the change in the death-rate may this year be as much marked in the opposite direction, which I should greatly regret. A contrary opinion, however, would be against my own convictions, and probably lead to disappointment.

Pursuant to your instructions proceedings have been instituted against the following persons, resulting in the convictions named below:—

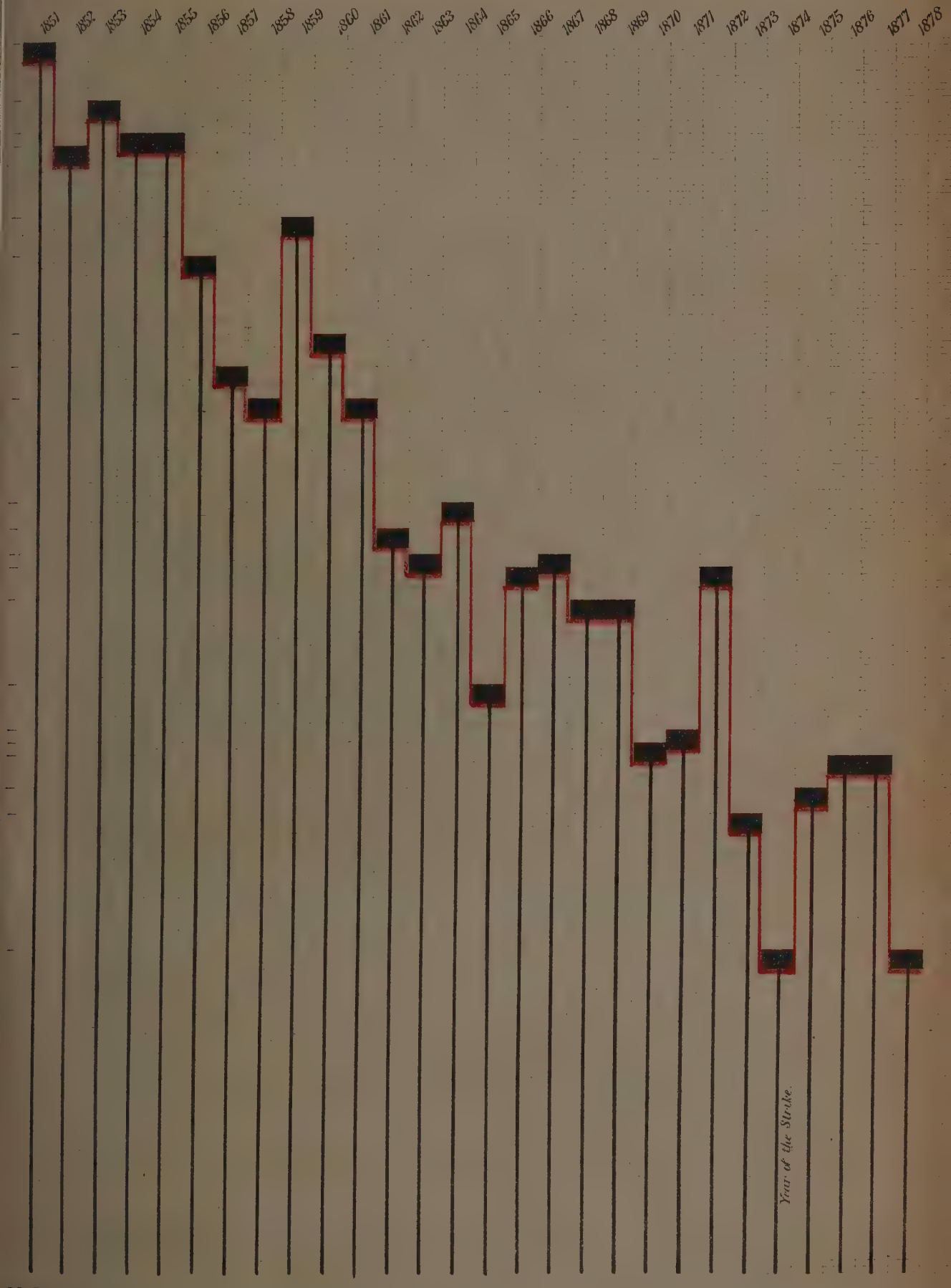
David Bickley, Springbank Colliery, one conviction, 5*l.* and costs.
Harvey and Fithern, Upper Gornal Colliery, one conviction, 10*l.* and costs.
Wellings and Hinley, Priorfield Colliery, three convictions, 4*l.* 10*s.* and costs.
F. G. Pearson, Crown Claymine, one conviction, 10*l.* and costs.
Jabez Griffiths, Denbigh Hall Colliery, one conviction, 2*l.* and costs.
Isaiah Short, Ebenezer Colliery, one conviction, 2*l.* and costs.
Isaac White, Golds Green Colliery, one conviction, 5*l.* and costs.
Abraham Hill, Fibbersley Colliery, one conviction, 10*s.* and costs.

Metalliferous Mines Act.

Elias Crapper, Hatherton and Portland Street, Limestone mines, three convictions, 4*l.* 5*s.* and costs.

I again insert a similar diagram to that I introduced into my report last year showing the number of lives lost up to the present time, including those of the year just past, which presents a birdseye view of the annual loss of life in this mining district from the beginning of Government inspection of mines down to the year under review.

Diagram showing the number of Fatal Accidents in South Staffordshire and Worcestershire from 1850, to 1878 inclusive.



N.B. The fatalities in Ironstone and Fireclay Mines are included since the passing of the Act of 1872.

James Baker
Inspector of Mines

Dangerfield, Lith 22, Bedford St Covent Garden.

The following statement shows how myself and my assistant disposed of our time during the year 1878.

	Days.
Underground and surface inspections	278
Mines visited	500
Mines visited without complaint or accident	370
Inquests attended	15
Attending police courts	10
Attending assizes	3
Office work	94
Laying informations	4
Arbitration	4
Board of examinations	2
Leave of absence	34
General duties	124
In London	29

General Instructions to the Inspectors.

The general instructions to the Inspectors of mines, apart from their duties enjoined by the various Acts of Parliament issued in July last, have in my opinion already been productive of much good, and cannot fail to prove in the future highly beneficial to Inspectors, owners of collieries, and miners alike; and, speaking for myself, I regret that something of the kind was not issued years ago, as the code, as a whole, forms a compendium of most useful instructions and advice. I may observe that I have since my appointment adopted a course of action in general agreement with these instructions with regard to inspection, and attribute my success in securing so remarkable a reduction in the fatalities attending the mining operations of this district, which was for a long period notorious for its terrible loss of life, to adopting in the main the principles contained in these useful instructions in carrying out the provisions of the various Mines Regulations Acts; such an authoritative statement of the inspectors duties cannot fail to strengthen his hands in enforcing the provisions under the various Acts of Parliament.

The instructions particularly refer to General Rule 30, which affords the working colliers an opportunity to inspect the mine for themselves. Their attention has been called to it, but in very few cases have they availed themselves of this important and useful provision.

Of the 50 deaths already alluded to, 47 were the result of 44 accidents in coal mines; two happened in ironstone mines resulting in two deaths, and one was the result of an accident in one of the fireclay mines. With a few exceptions all these fatalities come within the usual class of casualties common to mining in its varied forms, and require no special remarks other than those made upon each case in the list itself. I shall therefore only deal with Nos. 3, 18, 19, 25, 37, 38, 39 and 42.

Of the above fatalities in coal mines, one was the result of an explosion of fire-damp, 31 occurred by falls in the mines, seven took place in shafts, seven are due to miscellaneous causes underground, and one happened on the surface.

Of those in ironstone mines one was the result of a fall of measures in the mine, and one took place in a shaft, and the one due to fireclay mines also happened in a shaft.

No. 3 happened at the Eight Locks Colliery. It was found after the accident that a shot-hole had been greatly overcharged with powder, which blew the ramming or stemming clean out, and the volume of flame from the ignited powder was forced down the gateway, enveloping and severely burning the three deceased at a point where they had gone for safety from the shot. None of the unfortunate men were killed at the time, but died some weeks afterwards.

No. 18. In this case the deceased was at work in a drift or headway, and neglected to timber or prop the overhanging coal The manager of the mine also took no notice of it, and during the day a fall of coal occurred depriving the unfortunate man of his life. The deceased was doubtless blamable for not taking better care of himself, but the manager was equally so, if not more culpable, for not enforcing a due observance of the law. The case was duly reported to you, and the owner (the manager) was by your directions subsequently summoned before the magistrates and fined 5*l.* and the costs.

No. 19 happened at a new sinking pit at Hamstead. After the sinking had progressed a considerable distance, a drift was made for pound room for water, and whilst the deceased with several others was engaged bricking the sides a mass suddenly fell without warning and killed him. This kind of ground is unlike coal seams, and it is more difficult to guard against falls in working in it owing to the fact that it rarely presents any cleavage in the structure, which, generally speaking, affords some warning of danger in the coal measures.

No. 25 also occurred at a sinking pit. This was a very unusual accident and appeared almost inexplicable. Several men were at work at the bottom of the shaft which was being sunk. The unfortunate man who lost his life had charge of the sinking bowk. He signalled for it to be drawn up, and when within a few yards of the top it fell from the foot-hook of the rope and killed him, injuring several others. Judging from information from the workmen at the pit, and repeated tests which I made with the winding tackle, we came to the conclusion that the "bowk" must have been improperly attached to the foot-hook, and during the ascent twisted round and slipped off.

No. 37. This accident happened at the Swan Colliery, Lower Gornal, to a horse driver, 14 years old. He had taken up a collier's pike, with which he had nothing to do, and whilst playing with it a fall of clod from the side took place, forcing his head upon the point of the pike, which penetrated his brain and killed him upon the spot.

No. 38. The overman of the Reed's Wood Colliery, having commenced to cleanse the scaffold of an old and long disused pit-shaft, stood without any support or protection whatsoever removing the dirt until he had reached the scaffold itself, which, from the decay of the timber, fell, precipitating him down the shaft into several yards of water where he was drowned. If the deceased had taken the precaution to sling himself to the side of the shaft, or had sat in the bowk and examined the scaffold, he would have discovered its decayed condition and thus saved his life.

No. 39. The unfortunate youth who lost his life in this case was employed at the Upper Gornal Colliery at a newly commenced pit. He was pushing the skip towards the shaft, when from its being unfenced he pushed the skip into the shaft and fell after it. The neglect to fence the pit being a violation of the 14th General Rule, the owner was by your directions summoned before the magistrates and fined 10*l.* and costs.

No. 42. A case of this kind ought never to have happened, and could not with the exercise of due care on the part of the unfortunate sufferers themselves. Such cases, however, do occur at public railway stations and other places, both in the dark and in broad daylight. The deceased had gone to the lamp house for his safety lamp, and instead of going direct to the pit wandered about in the dark out of the proper track, and was struck by one of the locomotive engines and killed on the spot. A life lost through thoughtless indiscretion.

Ironstone Mines.

Two lives were lost in these mines. One was a case where the cager doubtless believing that the cage was at its proper place of rest pushed a full tub into the shaft and followed it. Ordinary care on the part of the unfortunate man would have saved his life.

The other case was that of a pikeman who injudiciously was using a pike to get down the ironstone measure when a portion of it fell and deprived him of life. If he had continued to use the crowbar which he had previously employed instead of the pike in all probability his life would have been spared.

Fireclay Mines.

The only death which happened in these mines occurred at the Crown Mine, and was similar to that which happened at the Upper Gornal Colliery. In this case the pit-shaft was unfenced, and the banksman in the performance of his duty pushed the skip into the pit and followed it. The case having been fully reported to you, proceedings were by your directions instituted against the owner who was fined 10*l.* and costs.

Metalliferous Mines.

Only one fatal case happened during the year in these mines. The deceased having charged a shot and fixed the fuse for firing it, retired some distance behind one of the pillars. When the shot exploded a piece of limestone was hurled against an opposite pillar and rebounding struck him, causing his death a few days afterwards. This shows the peril to which the miner's occupation constantly exposes him.

Lives lost not comprised under the Mines Regulation Acts.

In this, as in former years, several persons have come to their deaths from different causes on or about the collieries which are not comprised under the various Mines Inspections Acts, and are therefore not included in the list appended to this report.

Only one of these calls for special notice. It was a most distressing case, and happened at the Sandwell Park Colliery. The members of the North Staffordshire Institute of Mining and Mechanical Engineers had arranged an excursion into this district for the purpose of visiting certain collieries and other works, and this appeared to be the first on their programme for the day.

Under the direction of Mr. Henry Johnson, the manager of the colliery, a considerable number descended the Sandwell Pit, and after inspecting the underground workings a portion of them returned to the pit-shaft. Eight of them stepped upon the cage to be drawn up, and before they had ascended more than 30 feet one of their number fell off pulling a second after him. The former fell on the edge of the sump, and was so seriously injured that he died shortly afterwards. The other fell into the sump, and he also died a few hours after the melancholy occurrence. The cage is of most ample size and capable of holding double the number. The unfortunate gentlemen, it appeared, stood at one end, and it is supposed that neither of them had had proper hold of the bars of the cage, and that the first lift from the bottom threw them off their balance from which they apparently could not recover. It was understood that one or both of the deceased were not in the habit of ascending and descending shafts. People unaccustomed to the daily ascent and descent in pit-shafts should be specially careful under such circumstances.

It may be stated that the other members of the Institute complimented the manager on the way in which the arrangements had been made for their reception, and the care with which they had been carried out. With a view, however, of preventing the recurrence of a similar accident, the jury at the inquest, with my concurrence, strongly recommended that a guard should be fixed at the end of the cage when persons are ascending or descending, as an additional precaution, which, however, the colliers laugh at, and regard as unnecessary, as they did the safety chain which I introduced years ago, before guides and cages were rendered compulsory, and which, I may here add, has saved many a man's life.

Spon Lane Colliery Case.

The subject of principal interest during the year in relation to the working and inspection of mines in this district has been the question of the danger of an influx of water into the Spon Lane Colliery, to which I alluded briefly in my last year's report as being then unsettled.

Information having reached me that the cleansing operations of the pit shafts were impeded by the influx of a large quantity of water through the *débris*, and that the water was accumulating at the adjoining collieries, I made inquiries respecting it, and wrote the following letter to the Company :—

"GENTLEMEN, Tettenhall Wood, Wolverhampton, 21st April 1877.

"INFORMATION has reached me that your pit shafts have a direct communication with those lately worked by Mr. Dawes, which communication consists of a headway or drift in the thick or ten yard coal seam, and in which it is also stated a dam has been constructed for the purpose of keeping back the water accumulating in the mines belonging to the Blakely Hall Colliery Company and those of Mr. Dawes. Therefore, in the event of this dam failing through leakage, or indeed any other cause whatsoever, the water would rush into your works, and probably bring about a most fearful catastrophe, which might be attended with great loss of life. I therefore respectfully call your attention to this matter, with a view to prevent an accident through the failing of the dam in question, or a sudden influx of water from your own or the mines adjoining and belonging to other proprietors.

"Your acknowledgment for and reply to this letter will oblige,

Gentlemen,

"Your obedient servant,

"Messrs. the Spon Lane Colliery Company, (Signed) JAMES P. BAKER.

"West Bromwich."

No notice was taken of this communication until May 2nd, when I received the following replies :—

"The Spon Lane Colliery Company, Limited,

"DEAR SIR, West Bromwich, 4th May 1877.

"I BEG to acknowledge the receipt of your communication of the 21st ultimo, and which I have duly laid before my directors, and at their request I herewith send you a copy of the Company's mining engineer's reply to the same, which the Board trust you will deem satisfactory.

"Yours truly,

"(Signed) J. B. SYLVESTER,

"Secretary."

"The Spon Lane Colliery Company, West Bromwich,

"GENTLEMEN, 2nd May 1877.

"REFERRING to the letter of Mr. J. P. Baker of the 21st ultimo, we are of opinion that he is not aware of all the facts of the case. On examining the plan of the *thick coal* workings in this

colliery we find that there are other roads through the fault besides that in which a *dam* was constructed by Mr. Tomson, and we have no doubt that the *water passes freely* through the other roads, and that the workings are full on both sides of the dam. Such being the case there can be no pressure upon the dam, and no reason to fear any sudden influx of water, such as Mr. Baker appears to apprehend. The refilling of the pit shafts which is in progress will, in our opinion, go far to stop the *come of water* in the pit shaft altogether. If it do not entirely accomplish this purpose it will certainly so lessen the flow as to bring it within easy control."

After several interviews with the consulting engineer and other persons on behalf of the company, with a view to persuade them to remove the danger, or withdraw the men, which produced no satisfactory result, I sent the following notice :—

"Coal Mine Regulations Act, 1872.

"35 & 36 Vict. Cap. 76. Sec. 46.

"*Notice.*

"To the Spon Lane Colliery Company, Limited, Owners of the Spon Lane Colliery or Mine.

"Whereas on inspection and information in respect to the condition of the above-mentioned mine, I find the following matter, viz., that a serious and increasing accumulation of water exists near to and in connexion with your mining works at the above named colliery, which may rush into your mine or pit-shafts and overwhelm everything and everybody therein.

"And whereas I am of opinion that the said matter is dangerous, and threatens or tends to the bodily injury of the workmen or any other persons employed therein and thereat.

"Now I hereby give you notice forthwith to remedy the said matter.

(Signed) James P. Baker,
"Her Majesty's Inspector of Mines for
"South Staffordshire and Worcestershire.

"This 12th day of June 1877."

No attention being paid to the notice within the time prescribed by the statute, proceedings were instituted by your authority. The case was heard before the Wednesbury Bench of magistrates, when defendants only plea was that they were doing everything within their power for the removal of the danger, and that negotiations were going on for the purchase of a pumping plant belonging to an adjoining owner, and they urged the bench to suspend proceedings so as to afford them an opportunity of getting rid of the danger. The magistrates repeatedly pressed the company to withdraw the men until these operations were completed, but defendants not complying with these suggestions were eventually convicted in a penalty of 10*l*., and a further sum of 10*s*. per day so long as the offence should continue.

Against this conviction the company appealed to the Quarter Sessions at Stafford, and after a protracted hearing the court found that there was danger through an accumulation of water, and also strongly urged the appellants to withdraw their workmen, but without avail. The Court, however, quashed the conviction, with the suggestion that the question should be submitted to the Court of Queen's Bench.

The case was heard in May before the Lord Chief Justice and Mr. Justice Field, and as the shorthand writers' notes show, so far as that hearing went, the learned judges upheld the conviction, owing, however, to a dispute the case was sent back for an amendment of the date of the summons, and on the re-hearing in June the Lord Chief Justice and Mr. Justice Mellor upheld the decision of the Quarter Sessions. The following report is from the "Times" of June 24, 1878.

Queen's Bench Division.

(Sittings in Banco, before the Lord Chief Justice, Mr. Justice Mellor, and Mr. Justice Lush.)

The Queen, on the prosecution of the Inspector of Mines v. *the Spon Lane Colliery Company, Staffordshire.*

"This was an appeal by Mr. Baker, one of the Inspectors of Coal Mines, against a decision of the Quarter Sessions for Staffordshire quashing a conviction by magistrates of the defendants, the Spon Lane Colliery Company, in that county. The charge was made under the Coal Mines Regulation Act, 1872, and it raised a question of great importance as to the effect of that Act, on which there was a difference of opinion, and the Court of Appeal have lately been divided as to whether in such cases there is an appeal to the Court. The Act 35 and 36 Vict. provides (sec. 46) that if an Inspector is of opinion that a mine is in such a position as to tend to danger of bodily injury or death to those engaged in the mine, he may give notice to the manager or agent of the mine, and if (with a power for the owner to appeal to the Secretary of State) the manager does not remedy the danger, the Inspector may lay an information; provided that the Court, if satisfied that the owner has taken

measures to remove the danger, and that such measures will be completed within a reasonable time, may adjourn the decision for that purpose, and then may abstain from inflicting any penalty." On the 12th of June 1877, Mr. Baker, the Inspector, gave notice to the agent of the mine that there was a serious and increasing accumulation of water near to or in connexion with the mine, which water might at any moment rush into the mine and overwhelm everybody in it, and he therefore considered the mine in a state of imminent danger to life. The owners, in his opinion, failed to comply with his requisition, and in August last he laid an information against them, and they were summoned before two magistrates to answer the charge. It was not disputed that at that time there was, from the cause assigned, danger to life in the mine, though the cause was not in the mine itself, but in an adjoining mine. The fact was that in an adjoining colliery, not belonging to the defendants, there was an old shaft, in which the water had been allowed to accumulate and stood at a height above the level of the "lode" in which some of the defendants' men were working, and the magistrates convicted the defendants. The conviction stated that one of the Inspector of mines had found that part of the mine of the defendants was in a condition dangerous to life, and that he had given them a notice stating the particulars in which he considered it dangerous, and which required them to remove the danger, but that in 20 days they had not complied with the order, for which they were fined 10*l*. On appeal to the Sessions, however, they quashed the conviction, the defence set up being that the company had purchased the adjoining mine for the purpose of pumping the water out of the old shaft, and thus to remove the danger. Against that decision the Inspector appealed, contending that the company were bound to withdraw their men until the danger was removed.

"Mr. Gorst, Q.C. (with Mr. C. Bowen), appeared for the Inspector, and submitted this view to the Court, urging that the great object of the Act was to protect the lives of those working in the mines, and that, therefore, the men ought to be removed until the danger was removed, and it would take some time to draw out the water.

"Mr. Bosanquet, on the part of the owners of the colliery, urged that the enactment only applied where the cause of danger was in the mine belonging to the defendants, as it applied only where, at the time of the information, the defendants had the power of removing the danger, and they did not, in this case, acquire the power until they had effected a purchase of the adjoining mine, which they were not bound to purchase.

"Mr. Justice Lush pointed out that it appeared from the Inspector's report that there was danger of the water rushing into the defendants' mine and overwhelming everyone in it.

"Mr. Justice Mellor observed that the prosecutor contended that the men in the mine ought to be withdrawn until the cause of danger is removed, whether the cause of danger was within the mine or out of it.

"The Lord Chief Justice remarked that the validity of the order of the magistrates must depend on the state of things at the time the order was made. The owners of the colliery were bound to obey the order of the Inspector, unless they appealed to the Secretary of State, and here the defendants had not appealed to the Secretary of State. Then, had the defendants disobeyed the order?

"Mr. Bosanquet urged that the enactment did not apply where the cause of danger was in another mine not belonging to the defendants, and which could not, therefore, be removed without going on the land of other persons, and entering a mine not belonging to the defendants.

"Mr. Gorst, in reply, urged that in this view the enactment would be nugatory, for there might be imminent danger from some cause in a different mine, of which the owners of the mine not being worked, might not be aware, and which might not be known until disclosed by the inspector; *the real offence, therefore, was in not complying* with the requisitions of the Inspector, which were necessarily directed to the owners of the mine in which the danger was, there being no danger in the mine in which the cause of the danger existed. *A mine not worked was not* within the Act, so that the notice could not be given to the owner of the adjoining mine.

"The Lord Chief Justice, however, said the notice of the Inspector was to remove the cause of the danger, not to remove the men from the danger. The truth was that the Act had omitted to provide for such a case as the present. It ought to be in the power of the Inspector to say, 'Until you apply 'a remedy you must withdraw the men;' but there was no such power.

"Mr. Gorst urged that there were two ways of obviating a danger—by removing the cause of danger, or by withdrawing the men from the danger; that the notice of the Inspector was general, to remove the danger; and that if the owners could not or would not remove the cause of danger they ought to withdraw their men.

"The Lord Chief Justice, however, said he could not adopt that view, and thought that the Inspector had only power to give a notice to remove the cause of danger, and that the Act did not require him to direct that the men should be withdrawn until the danger was removed; nor had he so directed in this case. The enactment only applied where the Inspector pointed out a cause of danger in the mine of the defendants which they had power to remove. A party could not be liable to a penalty for not doing something on the land of his neighbour, there being no power to enter his neighbour's mine for the purpose The present case, therefore, did not appear to come within the enactment at all.

"Mr. Justice Mellor was of the same opinion, thinking that the enactment only applied to matters —causes of danger—in the mine of the defendants themselves and which they had power to remove. The Inspector only had power to give a notice to remove the cause of danger when it was in the defendant's mine; and such was the notice he had given. If the cause of danger was in the defen-

dants' mine, then it must be removed, and until it was removed the mine could not be worked; but it was otherwise where the cause of danger was in another mine not belonging to the defendants, and therefore the conviction could not be supported, and the decision of the Sessions quashing it was right.

"Mr. Justice Lush, however, differed, and expressed his regret that there should be a difference of opinion on the construction of an Act of such great importance. In his view, if there was danger to life in the mine of the defendants, the Inspector had power under this enactment to give notice to the owners of the mine in which the danger existed; and if the danger could not be removed by the defendants, then the mine could not be worked until the danger was removed; and the notice made it the duty of the manager to withdraw the men from the mine. He agreed that at the time of the conviction the defendants had not the power of withdrawing the water from the adjoining mine, but that did not entitle the defendants to treat the notice as nugatory; they ought to have withdrawn their men from the mine which was in danger. He thought, therefore, that the conviction was right, and that the decision of the Sessions was wrong.

"As, however, the majority of the Court were of a different opinion, the decision of the Sessions was affirmed, and the conviction is, therefore, quashed."

This decision may, I fear, not only seriously interfere with the future action of the Inspectors in such cases, but place the lives of miners in the utmost peril, as it appears that owners can with impunity go on working their mines in the face of any amount of danger which may exist in, on, or about adjoining properties. If such a construction of the statute can be maintained I would respectfully submit the desirability of some alteration in the law to meet cases of this character, otherwise there is no telling what may happen in the future working of the mines of this country. The owners having failed to negotiate for pumping the water on the adjoining collieries was no excuse for their neglect or unwillingness to erect pumping machinery at their own shafts which, I regret to have to say, does not appear to have been submitted to the court.

Immediately after this decision I had the honour of an interview with you at the Home Office, when you directed that a similar notice to the one served in June should again be served on the company.

This was accordingly done, and in due course they asked for the matter to be settled by arbitration.

Mr. James Whitehouse, mining engineer, was appointed on behalf of the Secretary of State, and Mr. Henry Johnson, mining engineer, on behalf of the owners. Mr. Bryham was appointed umpire, and the case lasted two days. A number of eminent mining engineers of the district gave their testimony in support of the allegation on which the notice was founded. On behalf of the owners, other mining engineers, whilst admitting the accumulation of the water in the adjoining collieries and the communication between them and the colliery in question, stated in their opinion there was no danger of such a sudden influx of water as was apprehended under the notice. The arbitrator on behalf of the owners further urged that as they had considerably reduced the height of the column of water, any danger that existed was so far diminished. The following is the umpire's award :—

"To all to whom these presents shall come, I, William Bryham, of the Rose Bridge Colliery, Wigan, in the county of Lancaster, mining engineer, send greeting. Whereas James Phillip Baker, Her Majesty's Chief Inspector of Mines for the South Staffordshire and Worcestershire district, duly served the Spon Lane Colliery Company, Limited, the owners of the Spon Lane Colliery or Mine in the said district, with a notice under the Coal Mines Regulation Act, 1872, section 46, dated the thirteenth day of July one thousand eight hundred and seventy-eight, in the words following :—'Whereas on 'inspection and information in respect to the condition of the above-mentioned mine I find the 'following matter, viz., that a serious and increasing accumulation of water exists near to and in 'connexion with your mining works at the above-named colliery, which may rush into your mine or 'pit shafts and overwhelm everything and everybody therein. And whereas I am of opinion that 'the said matter is dangerous and threatens or tends to the bodily injury of the workmen or any 'other persons employed therein and thereat. Now I hereby give you notice forthwith to remedy 'the said matter.' And whereas the said Spon Lane Colliery Company, Limited, objected to remedy the matter complained of in the notice, and did within twenty days after the receipt of such notice send their objection in writing, stating the grounds thereof, dated the thirtieth day of July one thousand eight hundred and seventy-eight, to the Right Honourable Richard Assheton Cross, Her Majesty's Secretary of State for the Home Department, whereupon the matter had to be determined upon by arbitration in the manner provided by the said Act. And whereas by an instrument in waiting, dated at Whitehall on or about the twelfth August one thousand eight hundred and seventy-eight, under the hand of the said Right Honourable Richard Assheton Cross, he duly appointed Mr. James Whitehouse, mining engineer, of Burnt Tree, Tipton, Staffordshire, to be the arbitrator on his behalf in the said matter. And whereas the said Spon Lane Colliery Company, Limited, did, on or about the nineteenth day of August one thousand eight hundred and seventy-eight, duly appoint Henry Johnson, of Dudley, mining engineer, to be their arbitrator in the said matter. And whereas the said arbitrators before they entered upon the matters referred to them did, by writing under their hands dated on or about the sixth day of September one thousand eight hundred and seventy-eight,

duly appoint me, the undersigned William Bryham, to be the umpire in the said matter. And whereas the said arbitrators failed to make their award within twenty-one days after the day on which the last of them was appointed, and did not extend the time for making their award. Now I, the said umpire, having taken upon myself the burthen of the said arbitration, and having duly weighed and considered the several allegations of the said parties, and also the proofs, plans, and documents which have been given in evidence before me, do hereby make and publish my award in writing of and concerning the matters above referred to me in the manner following, that is to say:—I award and adjudge that the allegation contained in the said recited notice of the thirteenth day of July one thousand eight hundred and seventy-eight is not proved. And I further award and adjudge that there was not at the time the notice was given, nor has there been since, any danger of any sudden influx of water into the said Spon Lane Colliery or Mine which would threaten or tend to the bodily injury of any person. And I award and adjudge that the payment to the said arbitrators for their services in this arbitration, and to me the umpire for my services in the said matters, and the costs of the arbitration and award shall be paid by the said James Philip Baker as such Inspector of mines as aforesaid, on behalf of the Secretary of State.

"(Signed) WILLIAM BRYHAM.

"4th October 1878."

The above award has not only occasioned me, but many others in the district conversant with the facts of the case, much surprise. First, the company have never, so far as I am able to recollect, in any of the courts in which they have appeared by evidence or by argument attempted to deny the accumulation of water and the danger consequent thereon.

Second, the company have throughout pleaded that they were doing to the extent of their power to remove the danger complained of, and at a serious cost of expenditure.

Further, and since the last notice was served an additional engine has been purchased to assist the pumping power at the recently purchased pumping plant of an adjoining colliery.

This was fully submitted to the shareholders of the company at their annual meeting in August last, when the chairman expressed a hope that with this auxiliary engine the water in question would soon be pumped out below the level of the entrance to the works at Spon Lane, and thus remove any chance of danger from that cause. Considering that these purchases were not made until after the service of the first notice, and the cost of maintaining them in operation, as their chairman said at the annual meeting, "With a view to remove any chance of danger from the accumulation of water," how the company and their officials could put forward the plea and maintain before the umpire that there was no danger is beyond my comprehension.

LIST of DATES of EXPLOSIONS of GAS which caused injuries, but were non-fatal, in South Staffordshire and Worcestershire District during the year 1878.

January, 12, 23, 30.	July 4, 13.
February 15.	August 10, 14, 29.
March 1, 2, 7, 13.	September 4, 5.
May 30.	October 25, 30.
June 15.	December 20, 23.

On the 1st March 1878 a pit was found to be in a dangerous condition from the abundance of gas without any explosion occurring.

I have the honour to be,
Sir,
Your obedient servant,
JAMES P. BAKER.

The Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department,
London.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the SOUTH STAFFORDSHIRE AND WORCESTERSHIRE DISTRICT, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878.														
Jan. 24	1	Brettell Lane -	Brierley Hill -	G. K. Harrison - -	Edwin Dias - -	Pikeman -	31	Fall of coal from roof of holing. He was trying to get the coal down when it fell, and mortally injured his head.	–	1	–	–	–	1
„ 25	2	Harden -	Walsall - -	E. Crapper & Co. -	Saml. Bird -	Ditto -	55	Fall of roof coal. Injured on 12th inst.; died this day in the Cottage Hospital, Walsall.	–	1	–	–	–	1
Feb. 4	3	Eight Locks -	West Bromwich	Barbors Field Co. - -	Em. Bratt -	Ditto -	52	Injured by blown out shot on the 2nd inst. Died this day.	–	–	–	2	–	2
„ 11	„	Ditto -	Ditto. -	Ditto - -	John Hill - -	Ditto -	53							
„ 14	4	Prince of Wales	Dudley - -	Dudley Colliery Co. -	Amos Worton -	Ditto -	28	Fall of roof coal in thick coal pit from smooth face parting whilst drawing timber props.	–	1	–	–	–	1
„ 15	5	Buffery Old -	Ditto - -	B. Raybould & Co. -	W. Evans - -	Loader -	39	Fall of roof coal and slack through settings in gate-road whilst assisting to set timber; caused by a bump.	–	1	–	–	–	1
„ 14	6	Haden Hill -	Old Hill - -	W. Bassan & Co. -	James Pugh -	Driver -	12	Found seriously injured under full tub on 13th instant. Died this day.	–	–	–	1	–	1
„ 14	„	Eight Locks -	West Bromwich	Barbors Field Co. - -	James Tonks -	Pikeman -	50	Injured by accident No. 3 on 2nd instant. Died this day in the West Bromwich Hospital.	–	–	–	1	–	1
„ 15	7	Hatherton -	Bloxwich -	G. and R. Thomas -	Alf. Cope - -	Loader -	18	Fall of rock roof from between the timber props; caused by a slip.	–	1	–	–	–	1
„ 25	8	Sandwell Park -	West Bromwich	Sandwell Park Colliery Co.	John Guest -	Pikeman -	40	Fall of coal roof in thick coal pit, caused by a bump which knocked some of the timber props out.	–	2	–	–	–	2
					Wm. Guest - -	Ditto -	36							

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
878. Feb. 27	9	Oakham - -	Dudley -	Oakham Colliery Co. -	J. Detheridge -	Pikeman -	45	Fall of coal roof in thick coal pit whilst examining the roof and getting down the loose hanging coal.	–	1	–	–	–	1
Mar. 5	10	Cakemore -	Oldbury - -	Cakemore Colliery Co. -	J. Thompson -	Ditto -	30	Fall of clod roof and coal in thick coal, owing to the presence of a network of unseen slips.	–	1	–	–	–	1
„ 7	11	Wyrley Cannock	Walsall - -	Wyrley Cannock Colliery Co.	Geo. Adams -	Stallman -	37	Fall of rock roof in an airway which deceased was trying to force down after a shot.	–	1	–	–	–	1
„ 12	12	Homer Hill -	Cradley -	Homer Hill Colliery Co. -	J. Millington -	Timberer -	65	Fall of clod roof whilst repairing gate-road and removing the timber.	–	1	–	–	–	1
„ 14	13	West Cannock -	Hednesford -	West Cannock Colliery Co.	T. Eccleshall -	Master Sinker.	32	Fell out of bowk whilst descending	–	–	1	–	–	1
„ 22	14	Oakham -	Dudley - -	Oakham Colliery Co. -	Jos. Timmins -	Pikeman -	50	Fall of coal roof in thick coal. Deceased knocked out the timber and incautiously went under the coal when it fell and crushed him to death.	–	1	–	–	–	1
April 27	15	Swan - -	West Bromwich	Swan Colliery Co. -	W. Worton - -	Deputy -	49	Fall of roof in thin coal. Whilst deceased was examining the roof a mass fell from between the timber upon him, causing his death two hours after.	–	1	–	–	–	1
May 4	16	Shut End -	Kingswinford -	J. Bradley & Co. - -	J. Glazebrook -	Engineer -	45	Fell out of cage whilst descending -	–	–	1	–	–	1
„ 25	17	Brades Hall -	Oldbury -	Brades Hall Colliery Co. -	Isaac Crompton -	Pikeman -	30	Injured by fall of coal in thick coal pit on the 23rd instant, died this day. After removing the "sprags" deceased went under the hanging coal again, when a bump forced a mass down upon him.	–	1	–	–	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
May 29	18	Springbank	Willenhall	Springbank Colliery Co.	Geo. Ryder	Pikeman	23	Fall of coal	–	1	–	–	–	1
„ 31	19	Hamstead	Great Barr	Hamstead Colliery Co.	Thos. Page	Sinker	50	Fall of the side of a roadway in red measures driven for pound-room near sinking pit shaft.	–	1	–	–	–	1
June 10	20	Swan	West Bromwich	Swan Colliery Co.	R. Hughes	Pikeman	30	Injured by explosion of firedamp on the 30th May. Died this day in the West Bromwich Hospital.	1	–	–	–	–	1
„ 15	21	Saltwells	Dudley	Earl of Dudley	A. Randle	Ditto	48	Fall of coal in thick coal pit, whilst deceased was getting down some "veins." He, to escape the fall, jumped or slipped under it, and was crushed to death.	–	1	–	–	–	1
„ 23	22	Barbor's Field	Bilston	Barbor's Field Co.	R. Clouds	Driver	16	Injured by fall of coal, 27th Nov. 1877. Died this day.	–	1	–	–	–	1
„ 27	23	Oakham	Dudley	Oakham Colliery Co.	B. Bellingham	Shot-firer	56	Fall of rock roof. Injured 28th March. Died this day.	–	1	–	–	–	1
„ 25	24	Cannock Chase	Walsall	Cannock Chase Colliery Co.	R. Lewis	Pikeman	47	Crushed by tub against a tree in a trial head. Deceased had no business whatever in the place.	–	–	–	1	–	1
July 16	25	Blakeley Hall	Oldbury	Bromford Colliery Co.	F. J. Woodward	Sinker	25	Whilst sinking "bowk" was ascending it fell off the foothook attached to winding rope. Deceased had sole charge of the bowk when it left the pit bottom.	–	–	1	–	–	1
„ 20	26	Cricket Field	Brierley Hill	George Fothergill	T. Oakley	Pikeman	24	A large piece of coal rolled down from the top of a large fall, and pinning the deceased against a tree dislocated his neck.	–	1	–	–	–	1
„ 31	27	Great Bridge	Tipton	R. Mason & Sons	T. Wilding	Ditto	31	Fall of coal, thick coal, caused by a bump.	–	1	–	–	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878.														
July 31	28	Leigh's Wood -	Aldridge -	Leigh's Wood Colliery Co.	Jos. Butler -	Timberer -	38	Deceased was repairing an airway, when a heavy fall of roof took place, which broke down the timber and suffocated him.	–	1	–	–	–	1
Aug. 2	29	Pelsall - -	Pelsall - -	Pelsall Coal and Iron Co. -	D. Whitehouse -	Ditto -	45	Fall of roof in airway, which deceased was engaged repairing and enlarging. He incautiously went beyond the timber protection and lost his life.	–	1	–	–	–	1
„ 14	30	Brettell Lane -	Brierley Hill -	Harris and Pearson -	Sam. Grice - -	Engineer -	63	Improperly rushing through cage was mortally injured on the 13th instant. Died this day.	–	–	1	–	–	1
„ 19	31	Yew Tree -	Rowley Regis -	Cochrane & Co. - -	E. Robinson -	Pikeman -	38	Whilst engaged at a top "inset" deceased pushed tub into the shaft and followed it.	–	–	1	–	–	1
„ 23	32	Old Park -	Dudley - -	Earl of Dudley - -	Matt. Lowe -	Loader -	19	Fall of roof in "thick coal." Brought about by a bump.	–	1	–	–	–	1
„ 26	33	Wallows' -	Brierley Hill -	Ditto - -	John Smith - -	Bandsman -	31	Fall of roof and rock in gateroad whilst deceased was renewing timber, the result of a "bump."	–	1	–	–	–	1
Sept. 3	34	Horseley -	Tipton - -	Horseley Colliery Co. -	S. Whitehouse -	Pikeman -	32	A sudden rush of slack and gob from the roof of "bolthole" knocked a "bar" off the setting, which struck deceased and held him down under the falling debris.	–	1	–	–	–	1
„ 5	35	Neachills -	Willenhall -	Johnson & Co. - -	Hen. Lane -	Shot-firer -	59	Premature explosion of gunpowder on the 2nd instant. Died this day.	–	–	–	1	–	1
„ 21	36	Newbury Lane	Oldbury - -	Nicklin & Co. - -	T. Inkerman -	Pikeman -	45	Buried under a fall of slack and gob which fell through timber settings whilst at work repairing gateroad.	–	1	–	–	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878. Sept. 23	37	Swan - -	Lower Gornal -	James Cooper - -	Jos. Burrows -	Driver -	14	Fall of clod off side of gate-road, forcing deceased's head upon a pike which penetrated his brain and killed him upon the spot.	–	1	–	–	–	1
„ 27	38	Reeve's Wood -	Walsall - -	J. Dutson - -	Sam. Leach -	Overman -	53	Engaged cleansing an old scaffold in pit shaft 12 yards deep, when the "byatts" gave way, precipitating him down shaft into several fathoms of water.	–	–	–	1	–	1
Oct. 8	39	Upper Gornal -	Dudley - -	Harvey and Fithern -	W. Porter -	Driver -	15	Pushed skip into pit shaft and followed it.	–	–	1	–	–	1
„ 14	40	Foxyards -	Tipton - -	Edward Wones - -	W. Hampton -	Ditto -	—	Injured by tub on 6th ultimo. Died this day. Tub ran away and crushed deceased against side of road.	–	–	–	1	–	1
„ 26	41	Coneygre -	Dudley - -	Earl of Dudley - -	Thos. Grice - -	Pikeman -	21	Fall of coal in thick coal pit whilst bolding in a "man of war" pillar, brought about by a network of converging slips.	–	1	–	–	–	1
Nov. 11	42	Cannock and Rugeley.	Hednesford -	Cannock and Rugeley Colliery Co.	W. Bradbury -	Stallman -	40	Improperly crossing tramway was knocked down and run over by locomotive engine.	–	–	–	–	1	1
„ „	43	Sandwell Park -	West Bromwich	Sandwell Park Colliery Co.	Jos. Wilks -	Pikeman -	28	Fall of coal in "thick coal" whilst cutting "brazils."	–	1	–	–	–	1
Dec. 23	44	Fair Oak -	Rugeley - -	Fair Oak Colliery Co. -	W. Stanfield -	Stallman -	42	Fall of roof in thin mine - -	–	1	–	–	–	1
								Total - - -	1	31	7	7	1	47

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines. Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
IRONSTONE MINES.														
May 16	1	Saltwells	Dudley	Earl of Dudley	T. Gregory	Cager	60	Fell from "inset" into sump with full tub, expecting the cage was there.	–	–	1	–	–	1
„ 23	2	Old Park	Ditto	Ditto	Isaac Wall	Pikeman	35	Fall of measures off the face, which he had tried in vain to force down with a crowbar; not satisfied, he used a "pike," when the measure fell from an unseen slip.	–	1	–	–	–	1
								Ironstone, total	–	1	1	–	–	2
FIRE-CLAY MINES.														
Nov. 9	1	Crown	Brierley Hill	Pearson & Co.	Ed. Smith	Banksman	41	Fell down pit shaft. Deceased pushed empty skip into the pit and followed it.	–	–	1	–	–	1
								Fireclay, total	–	–	1	–	–	1
METALLIFEROUS MINES.														
Nov. 20	1	Groveland	Dudley Port	J. Bagnall, Sons, & Co.	W. Talbot	Miner	—	Injured on the 6th instant. Died this day. Deceased was accidentally struck by a piece of limestone from a shot.	–	–	–	1	–	1
								Metalliferous, total	–	–	–	1	–	1

Report of Assistant Inspector.

Sir, 14, Compton Road, Wolverhampton, March 24, 1879.

I have the honour to report to you, that in pursuance of Section 48 of the Coal Mines Regulation Act, 1872, and Section 20 of the Metalliferous Mines Regulation, 1872, I have exercised the duties of inspector in the district of South Staffordshire and Worcestershire, and that in so doing I have acted as assistant to and under the directions of Mr. Baker.

I have the honour to be,
Sir,
Your obedient servant,
W. B. SCOTT.

To the Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department.

LIST of MINES classed under the COAL MINES REGULATION ACT in MR. BAKER'S DISTRICT, 1878

Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager.	Remarks.
	COAL AND IRONSTONE.			
	COUNTY OF STAFFORD.			
Aldridge Colliery Co., Aldridge, Walsall	Aldridge	Aldridge	W. W. Evans.	
John Hall and Co., Amblecote, Stourbridge.	Amblecote	Brierley Hill	G. Skidmore.	
Ashmore Park Colliery Co., Wednesfield Wolverhampton.	Ashmore Park	Wednesfield	C. Jefcoat.	
James Holcroft, Old Hill, Dudley	Ash Tree	Old Hill	W. Powell	And ironstone.
Harris and Pearson, Amblecote, Stourbridge.	Brettell Lane	Brierley Hill	J. Groucott.	
G. K. Harrison, Lye, Stourbridge	Ditto	Ditto	W. Wiles.	
Barker and Pearson, Bank Street, Brierley Hill.	Bank Street	Ditto	J. W. Groucott.	And ironstone.
The Chillington Iron Co., Wolverhampton.	Bentley	Walsall	G. Williams	And ironstone.
George Williams, Bentley, Walsall	Birchills Hall	Ditto	J. Williams.	
The Bradford Colliery Co, Bentley, Walsall.	Bradford	Ditto	J. Davis.	
The Patent Shaft and Axletree Co., Wednesbury.	Balls Hill	West Bromwich	J. Harvey.	
Horton and Sons, Swan Village, West Bromwich.	Black Lake	Ditto	J. R. Cooksey.	
The West Bromwich Colliery Co., West Bromwich.	Brickhouse	Ditto	W. Mansell.	
Jos. Bailey and Son, Swan Village, West Bromwich.	Bellsmoor	Ditto	J. Ritson.	
The Patent Shaft and Axletree Co., Wednesbury.	Burrs	Wednesbury	J. Harvey.	
Wilson and Griffiths, Ocker Hill, Tipton	Blakeley Wood	Ditto	Z. Powell.	
W. J. Davies, Bradley, Bilston	Bradley	Bilston	W. J. Davies	And ironstone.
S. Mansell ditto ditto	Ditto (part of)	Ditto	Ditto.	
John Davies ditto ditto	Ditto ditto	Ditto	Ditto.	
W. Powell ditto ditto	Ditto ditto	Ditto	Ditto.	
H. Pigot ditto ditto	Ditto ditto	Ditto	Ditto.	
C. Kitson ditto ditto	Ditto ditto	Ditto	Ditto.	
Isaac Whitehouse, Coseley, Bilston	Bear Hall	Ditto	J. Taft.	
J. Bagnall and Sons, Limited, Golds Hill West Bromwich.	Bradley and Hallfields	Ditto	J. Ritson	And ironstone.
Executors of John Yardley, Brierley, Bilston.	Brierley	Ditto	W. J. Hayward	And ironstone.
John Lloyd, Lower Bradley, Bilston	Bradley Row	Ditto	T. Roper.	
H. B. Whitehouse and Son, Priorfield, Bilston.	Batman's Hill	Ditto	T. Gething.	
J. Davies and Co., Batchcroft, Bilston	Batchcroft	Ditto.		
Enoch Cooper, Upper Ettingshall, Bilston	Breen Ridding	Ditto	E. Whitehouse	And ironstone.
George Spruce, Bullpiece, Darlaston	Bullpiece	Darlaston		Ironstone.
The Brades Hall Colliery Co., Oldbury	Brades Hall	Oldbury	C. Mayfield	And ironstone.
W. H. Dawes, Bromford Iron Works, West Bromwich.	Blackheath	Rowley Regis	B. Callear.	
The Countess of Shrewsbury, Brereton, Rugeley.	Brereton	Rugeley	W. Bertram	And ironstone.
Colonel Harrison, Brownhills, Walsall	Brownhills	Brownhills	M. Webb, jun.	
Joseph Aston, Burnt Tree, Tipton	Burnt Tree	Tipton	J. Aston.	
The New British Iron Co, Corngreaves, Birmingham.	Blackwagon	Old Hill	W. B. Keen.	
Ditto ditto ditto	Bearmore	Ditto	Ditto	And ironstone.
Woodall and Co., Tansey Green, Dudley	Barrow Hill Coppice	Dudley.		
R. Mason and Sons, Dudley	Bloxwich	Bloxwich	T. E Lloyd.	
T. and M. Baugh, Bloxwich	Ditto	Ditto.		
Messrs. Newey and Woodall, Tansey Green, Dudley.	Cooper's Bank	Dudley.		
Wm. Webb, Cooper's Bank Dudley	Ditto	Ditto.		
Parsons and Cooper, Cradley Heath, Brierley Hill.	Cradley Heath	Cradley Heath	D. Parsons.	
T. Challoner, Cemetery, Bilston	Cemetery	Bilston		Ironstone.
Wasdell and Timmins, Upper Ettingshall, Bilston.	Crowsbridge	Ditto		Ironstone.
J. Walters and Co., Copesland, Bilston	Copseland (part of)	Ditto.		
D. Millard, ditto ditto	Ditto ditto	Ditto.		
Wellings and Hinley, ditto ditto	Ditto ditto	Ditto.		
The Church Colliery Co., Bilston	Church (part of)	Ditto.		
James Evans ditto	Ditto ditto	Ditto.		
Joseph Barker ditto	Ditto ditto	Ditto.		
David Vaughan, Cotterhill's Farm, Tipton	Cotterhill's Farm (part)	Tipton.		
Hartill and Parsons, ditto ditto	Ditto ditto	Ditto.		
Earl of Dudley, Priory Offices, Dudley	Coneygre (part)	Ditto	T. Latham.	
W. Hartshorne and Co., Crescent, Willenhall.	Crescent	Willenhall	W. Hartshorne	And ironstone.
Joseph Owen and Co., Brownhills, Walsall.	Coppice	Brownhills	F. J. Jones.	
The Conduit Colliery Co., ditto ditto	Conduit	Ditto	W. H. Whitehouse.	
The Cole's Farm Colliery Co., West Bromwich.	Cole's Farm	West Bromwich	J. Shakespear	And ironstone.

List of Mines—*continued.*

Owner or Company and Postal Address.	Name of Mine.	Where situated.	Manager.	Remarks.
John Bagnall and Sons, Limited, Golds Hill, West Bromwich.	Cop Hall	West Bromwich	J. Hough	And ironstone.
T. Simcox, Golds Green, ditto	Cricket Field	Ditto	W. J. Parton.	
The Cordley Colliery Co., ditto	Cordley	Ditto	E. Phillips.	
Farley and Duce, ditto	Cutler's End	Ditto	T. Parton.	
The Cannock and Rugeley Colliery Co., Hednesford.	Cannock and Rugeley	Hednesford	J. Williamson.	
The Cannock and Wimblebury Colliery Co., Hednesford.	Cannock and Wimblebury	Ditto	W. Blakemore.	
The New British Iron Co., Corngreaves, Birmingham.	Codsall	Old Hill	W. B. Keen	And ironstone.
Pearson and Co., Amblecote, Stourbridge	Crown	Brierley Hill	J. Groucott.	
T. Simcox, Golds Green, West Bromwich.	Crabtree (part of)	Wednesbury	W. J. Parton.	
Guy, Brothers, Wednesbury	Ditto	Ditto.		
J. Kimberley, 5, Fallings Heath, Wednesbury.	Ditto	Ditto.		
Edward Bowen, Clattershall, Stourbridge.	Clattershall	Brettel Lane.		
The Cannock Chase Colliery Co., Walsall.	Cannock Chase	Brownhills	A. Sopwith.	
The Cannock and Leacroft Colliery Co., Wolverhampton.	Cannock and Leacroft	Cannock	J. Hunter.	
The Castle Bridge Colliery Co. Wednesfield, Wolverhampton.	Castle Bridge	Wednesfield	W. Blakemore.	
The Cannock Old Coppice Colliery Co., Wyrley, Walsall.	Cannock Old Coppice	Wyrley	J. Hawkins.	
The Cannock Lodge Colliery Co., Bloxwich, Walsall.	Cannock Lodge	Bloxwich	A. H. Lindop.	
The Patent Shaft and Axletree Co., Wednesbury.	Crookhay	West Bromwich	J. Harvey.	
The Cakemore Colliery Co., Oldbury	Cakemore	Oldbury	R. Latham.	
Jones and Fothergill, Brockmoor, Brierley Hill.	Cricket Field	Brierley Hill.		
Frederick Parkes, Cleveland, Tipton	Cleveland	Tipton	N. Gething.	
Aaron Millington, Darlaston Green, Darlaston.	Darlaston Green	Darlaston		And ironstone.
The Patent Shaft and Axletree Co., Wednesbury.	Darlaston	Ditto	J. R. Cooksey.	
Griffiths, Brothers, Dudley Port, Tipton	Denbigh Hall	Dudley Port	J. Tomkins.	
Guy and Weed, Deepfields, Bilston	Deepfields	Bilston		And ironstone,
Earl of Dudley, Priory Offices, Dudley	Ditto	Ditto	W. Bulger.	
Colbourne and Perry, Dudley Port, Tipton	Dudley Port	Dudley Port	J. Tomkins.	
J. Bagnall and Sons, Limited, Golds Hill West Bromwich.	Deepmoor	Walsall	J. Ritson.	
Messrs. Gibbons, Dibdale, Dudley	Dibdale	Lower Gornal	B. Gibbons.	
Hickman and Co., Lye, Stourbridge	Delph	Brierley Hill	E. Green.	
John Hall and Co., Amblecote, Stourbridge.	Ditto	Ditto	T. Skidmore.	
Harris and Pearson ditto ditto	Ditto	Ditto	J. Groucott.	
J. Rollason, Delph, Brierley Hill	Ditto	Ditto.		
Thomas Guy and Co., Ettingshall Park, Wolverhampton.	Ettingshall Park (part of)	Wolverhampton.		
Dyke and Co., ditto ditto	Ditto	Ditto.		
Jos. Burrows, ditto ditto	Ditto	Ditto.		
Richard Bate, ditto ditto	Ditto	Ditto.		
John Bowen, Ettingshall Lodge, ditto	Ettingshall Lodge (part)	Ditto.		
William Bowen, ditto ditto	Ditto	Ditto.		
J. Cadman, ditto ditto	Ditto	Ditto.		
Riley and Co., Ettingshall, Bilston	Ettingshall (part)	Bilston.		
Rudge and Co., ditto ditto	Ditto	Ditto.		
T. Caswell, ditto ditto	Ditto	Ditto.		
J. Cole and Co., ditto ditto	Ditto	Ditto.		
Wasdell and Co., ditto ditto	Ditto	Ditto.		
S. Bannister and Co., Deepfields, Bilston	Ditto	Ditto	J. Hammond.	
The Essington Farm Colliery Co., Bloxwich, Walsall.	Essington Farm	Bloxwich	R. S. Dodd.	
The Darlaston Coal and Iron Co., Essington, Wolverhampton.	Essington Wood	Ditto	J. Smallman.	
The Barbor's Field Co., Bilston	Eight Locks	West Bromwich	T. Roper.	
Short and Harley, Hill Top, West Bromwich.	Ebenezer	Ditto	J. Tomkins.	
Skidmore and Webster, Old Hill, Dudley	Eagle	Old Hill	J. Skidmore, jun.	
The East Cannock Colliery Co., Hednesford.	East Cannock	Hednesford	J. Green.	
John Sims, Fallings Heath, Wednesbury.	Fallings Heath	Darlaston.		
The Darlaston Iron Bridge and Roofing Co., Darlaston.	Ditto	Ditto	J. Parton, Agent.	
The Patent Shaft and Axletree Co., Wednesbury.	Furnace Leasow	Wednesbury	J. R. Cooksey.	
The Fishley Colliery Co., Bloxwich, Walsall.	Fishley	Pelsall	R. S. Davenhill.	
The Fair Oak Colliery Co., Rugeley	Fair Oak	Rugeley	G. Shemmell.	
Mines Drainage Commissioners, Wolverhampton.	Fly	Old Hill		Pumping Station.

List of Mines—*continued.*

Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager.	Remarks.
Thomas Checkley, Lichfield Street, Walsall.	Forest	Bloxwich	T. Checkley	And ironstone.
Abraham Hill, Merridale Grove, Wolverhampton.	Fibbersley	Willenhall	A. Hill.	
J. W. and T. Pearson, Old Hill, Dudley	Firtree	Kingswinford	R. Groucott.	
The Earl of Dudley, Priory Offices, Dudley.	Foxyards	Tipton	T. Latham	And ironstone.
Edward Wones, 18, Woodsetton, Dudley	Ditto (part)	Ditto.		
Powell and Hunt, Foxyards, Tipton	Ditto	Ditto.		
Jeremiah Dawes ditto ditto	Ditto	Ditto.		
S. Minton and Co., Dudley	Grace Mary, New	Dudley	W. North.	
Grazebrook and Aston, Princes End, Tipton.	Gospel Oak	Tipton	T. Woolley.	
J. Bagnall and Sons, Limited, Golds Hill, West Bromwich.	Groveland	Ditto	J. Hough.	
Swindell and Collis, Stourbridge	Granville	Old Hill	W. B. Collis	And ironstone.
Noah Hingley and Sons, Primrose Hill, Dudley.	Gawn	Ditto	W. Davis	And ironstone.
J. Hastelow, Green Lane, Bilston	Green Lane	Bilston.		
Rigby and Simcock, Golds Hill, West Bromwich.	Golds Hill	West Bromwich	W. J. Parton.	
The Great Wyrley Colliery Co., Wyrley, Walsall.	Great Wyrley	Wyrley	D. W. Munro.	
A. Hickman, Spring Vale Furnaces, Wolverhampton.	Great Bridge	Great Bridge	A. Bowkley.	
R. Mason and Sons, Dudley	Ditto	Ditto	T. E. Lloyd.	
W. Hughes and Co., Lower Gornal, Dudley.	Graveyard	Lower Gornal.		
J. Carter, Golds Green, West Bromwich	Golds Green	West Bromwich	J. White.	
Round Brothers, Hauge Furnaces, Tividale, Tipton.	Hange	Tipton	I. Foley	And ironstone
Horseley Colliery Co., Tipton	Horseley	Ditto	R. Latham.	
Downing and Priests, Tividale, Tipton	Hallbridge	Dudley Port	J. Williams.	
A. Beddows and Co., Hall Park, Bilston	Hall Park	Bilston.		
The Hilton Colliery Co., Bloxwich, Walsall.	Hilton	Bloxwich	R. S. Dodd.	
G. and R. Thomas, Hatherton, Furnaces, Walsall.	Hatherton	Ditto	G. Povey	And ironstone.
E. Crapper and Co., Walsall	Harden	Ditto	J. J. Gettings.	
Hamstead Colliery Co., Great Barr, Birmingham.	Hamstead	Great Barr	I. Meachem	Sinking.
The Earl of Dudley, Priory Offices, Dudley.	Himley	Dudley	W. Bulger	And ironstone.
J. H. Chavasse, Kingswinford	Ditto (part)	Ditto	R. Groucott.	
J. Raybould, Brierley Hill	Ditto	Ditto	J. M. Fellows.	
The Countess of Shrewsbury, Brereton, Rugeley.	Hayes	Rugeley	Thos. Bertram.	
C. Cotterill and Co., Heathfield, Darlaston.	Heathfield	Darlaston	T. Parton, Agent.	
W. Bassano and Co., Old Hill, Dudley	Haden Hill	Old Hill	J. Woodall	And ironstone.
G. Parish and Co., Church Lane, West Bromwich.	Hall End	West Bromwich.		
W. Jones, ditto ditto	Ditto	Ditto.		
Hipkins, Turner and Co., Toll End, Tipton.	High Meadow	Tipton.		
J. Bagnall and Sons, Limited, Golds Hill, West Bromwich.	James Bridge	Walsall	J. Ritson.	
Jacob Chilton, Stone Cross, ditto	Jervoise	West Bromwich		
J. Springthorpe, King's Hill, Wednesbury.	King's Hill	Wednesbury.		
Roberts, Brothers, Leabrook, Wednesbury	Leabrook	Wednesbury.		
Thomas Longmore, ditto ditto	Ditto	Ditto.		
Edward Smith, Brunswick Tube Works, Wednesbury.	Ditto	Ditto.		
Isaac Smith, Leabrook, Wednesbury	Ditto	Ditto.		
The Patent Shaft and Axletree Co., Wednesbury.	Lodge Holes	Ditto	J. R. Cooksey	Ironstone.
W. and J. S. Sparrow and Co., Millfield, Bilston.	Ladymoor	Bilston	W. Furnival.	
Mark Gallear and Co., Willenhall	Little London	Willenhall		And ironstone.
J. and G. Spruce and Co., Wolverhampton	Lanesfield	Wolverhampton.		
Leigh's Wood Colliery Co., Aldridge, Walsall.	Leigh's Wood	Aldridge	W. L. Armstrong.	
W. Rushton, Little London, Willenhall	Little London	Willenhall.		
David Skidmore, Moxley, Wednesbury	Moorcroft, Old	Bilston	Roper	And ironstone.
Dudley and Co., Mount Pleasant, Bilston	Mount Pleasant	Ditto		And ironstone.
James Kirk, Priestfields, Bilston.	Mill Street	Ditto.		
The Patent Shaft and Axletree Co., Wednesbury.	Mounts	Wednesbury	J. Harvey	Ironstone.
Ditto ditto	Monway Field	Ditto	J. Harvey.	
Ditto ditto	Millfield	Ditto	Ditto.	
The Moorlands Colliery Co., West Bromwich.	Moorlands	West Bromwich	G. Roberts.	

List of Mines—*continued.*

Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager.	Remarks.
The Chillington Iron Co., Wolverhampton.	Merrill's Hole	Willenhall	C. Jefcoat.	
M. Gallear, Willenhall	Ditto (part)	Ditto.		
Bradley and Robinson, Moseley Hole, Wolverhampton.	Moseley Hole	Wolverhampton	G. Robinson.	
Executors of W. Walker, Brierley Hill	Moor Lane	Brierley Hill	W. Edwards.	
The Mid-Cannock Colliery Co., Cannock, Stafford.	Mid-Cannock	Cannock	R. Twigg.	
Crowson and Benton, Darlaston	Mallow Piece	Darlaston.		
Henry Boys, Park Hill, Walsall	Moat	Walsall	W. Hartshorne	Ironstone.
T. Challoner, High Street, Portobello, Willenhall.	Neachills	Wednesfield.		
The Barbor's Field Co., Bilston	Neachill's Hall	Ditto	T. Roper	And ironstone.
J. George and Co., Wednesfield	New Cross (part)	Ditto.		
Nash and Lees, Wednesfield	Ditto	Ditto.		
T. Morgan, Wednesfield	Ditto	Ditto.		
Maiden and Parkes, Birchills, Walsall	Newfield	Walsall	N. Gething.	
The Norton Cannock Coal Co., Bloxwich, Walsall.	Norton Cannock	Bloxwich	F. W. Peacock.	
E. Crapper & Co., Walsall	Newlands	Pelsall	C. Lester.	
H. and B. Caswell, Old Heath, Wolverhampton.	Old Heath	Wolverhampton	B. Caswell.	
The Earl of Dudley, Priory Offices, Dudley.	Old Park	Dudley	W. Bulger	And ironstone.
John Walker, Kingswinford	Oak Farm	Ditto	R. Groucott.	
J. Greenaway, Oak Farm, Dudley	Ditto (part)	Ditto	J. Greenaway.	
John Raybould, Brierley Hill	Orchard	Brierley Hill	R. Groucott.	
Noah Hingley and Sons, Primrose Hill, Dudley.	Old Hill	Old Hill	W. Davis.	
Addenbrookes and Co., Rough Hay, Darlaston.	Ocker Hill	Tipton	T. Parton.	
Henry Hall, Brierley Hill	Old Level	Brierley Hill	J. Williams.	
J. and W. Pearson, Old Hill, Dudley	Pearson's	Old Hill	R. Groucott	And ironstone.
Perry Hall Colliery Co., Wednesfield, Wolverhampton.	Perry Hall	Wednesfield	W. Blakemore, jun.	
Onions and Bailey, Parkfield, Wolverhampton.	Parkfield (part)	Wolverhampton.		
Herrington and Hooper, ditto ditto	Ditto	Ditto.		
Bradley and Robinson, Moseley Hole, Wolverhampton.	Pool Meadow	Willenhall	G. Robinson.	
The Pool Hayes Colliery Co., Willenhall	Pool Hayes	Ditto.		
W. Ward, and Sons, Priestfields, Wolverhampton.	Priestfields, New	Ditto	W. J. Parton.	
J. Bagnall and Sons, Limited, Golds Hill, West Bromwich.	Pump House	West Bromwich	J. Hough.	
S. M. Morgan and Co., Pelsall, Walsall	Pelsall Hall	Pelsall	J. Starkey.	
The Pelsall Coal and Iron Co., Pelsall, Walsall.	Pelsall	Ditto	M. Harle.	
John Raybould, Brierley Hill	Planet	Kingswinford	J. M. Fellows.	
The Tibbington Colliery Co., Prince's End, Tipton.	Prince's End	Tipton	R. Latham	And ironstone.
J. Colbourn, Sons, and Co., Park Lane, Tipton.	Park Lane	Ditto	J. Hammond.	
Thomas Nicholls, Priorfield, Bilston	Priorfield (part)	Bilston.		
Isaac Tyler, ditto ditto	Ditto	Ditto.		
Joseph Griffiths, ditto ditto	Ditto	Ditto.		
Wellings and Hinley, ditto ditto	Ditto	Ditto.		
R. Lett, Priestfields, Bilston	Priestfields (part)	Ditto		And ironstone.
Southan and Cartwright, Priestfields, Bilston.	Ditto	Ditto.		
Thomas Bryan, ditto ditto	Ditto	Ditto.		
Walker and Co., ditto ditto	Ditto	Ditto.		
J. Perry Jones, ditto ditto	Ditto	Ditto.		
Hodgetts and Co., Parkfield, Wolverhampton.	Parkfield (part)	Wolverhampton.		
Powell Brothers, Rough Hills, Wolverhampton.	Rough Hills	Wolverhampton.		
Jarvis and Co. ditto ditto	Ditto	Ditto.		
Smith and Roe, Cold Lanes, Bilston	Riddings	Bilston.		
The Executors of Stephen Cole, Rookery, Bilston.	Rookery	Ditto	S. Green.	
The Executors of E. Waldron, Old Hill, Dudley.	Riddings	Old Hill	Jer. Skidmore, jun.	And ironstone.
The Roughwood Colliery Co., Bentley, Walsall.	Roughwood	Walsall	J. Lindop	And ironstone.
The Earl of Dudley, Priory Offices, Dudley.	Ramrod Hall	Oldbury	W. North.	
The Rowley Hall Colliery Co., Oldbury	Rowley Hall	Ditto	J. Harris.	
The Earl of Dudley, Priory Offices, Dudley.	Rounds Hill	Tipton	T. Latham	And ironstone.
J. Addenbrookes and Co., Rough Hay, Darlaston.	Rough Hay	Darlaston	T. Parton.	
The Rowley Station Colliery Co., Rowley Regis.	Rowley Station	Rowley Regis	J. Tomkins.	
Richard Croft, Reeve's Wood, Walsall	Reeve's Wood	Walsall.		

List of Mines—*continued.*

Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager.	Remarks.
The Springbank Colliery Co., Willenhall	Springbank	Willenh	D. Bickley.	
The Pelsall Coal and Iron Co., Pelsall, Walsall.	Shortheath	Ditto	M. Harle.	
J. Simpson & Co., King's Hill, Wednesbury.	Springhead	Wednesbury	A. Deakin.	
Messrs. Whittle and Johnson, Rowley Regis.	Scotwell	Rowley Regis.		
Daniel Mason, Springhouse, Rowley Regis.	Springhouse	Ditto.		
J. Bradley & Co., Shut End, Dudley	Shut End	Kingswinford	D. Rogers	And ironstone.
Cochrane & Co., Woodside, Dudley	Ditto New	Ditto	T. Oakes	And ironstone.
Geo. Cockayne, Quarry, Bilston	Standiford Meadow	Bilston.		
Thomas Bantock, G.W.R., Wolverhampton.	Spring Vale	Wolverhampton	T. Williams.	
J. and T. Williams, Spring Vale, Wolverhampton.	Ditto (part)	Ditto	ditto.	
The Himley Firebrick Co., Oak Farm, Dudley.	Stourbridge Extension	Dudley	T. Brettell.	
Enoch Beardsmore, Lower Gornal, Dudley.	Swan	Ditto.		
The Darlaston Coal and Iron Co., Darlaston.	Spring Hill	Bloxwich	J. Smallman.	
Joseph Ford, Bloxwich, Walsall	Sneyd	Ditto	A. Deakin.	
Thomas Glaze, Lower Gornal, Dudley	Straits	Lower Gornal.		
The Swan Colliery Co., West Bromwich	Swan	West Bromwich	E. Phillips.	
The Stone Cross Colliery Co., West Bromwich.	Stone Cross	Ditto.		
Allen and Holden, Swan Village, West Bromwich.	Swan Farm	Ditto	T. Parton.	
The South Staffordshire Colliery Co., West Bromwich.	South Staffordshire	Ditto	W. J. Davies.	
The Sandwell Park Colliery Co., West Bromwich.	Sandwell Park	Ditto	H. Johnson, jun.	
The Spon Lane Colliery Co., West Bromwich.	Spon Lane	Ditto	C. McKenley.	
The Tipton Moat Colliery Co., Tipton	Tipton Moat	Tipton	R. Latham	And ironstone.
The Tipton Green Colliery Co., Tipton	Tipton Green	Ditto	E. Davis.	
W. and C. E. Bradley, Tividale, Tipton	Tividale Hall	Ditto	J. Evans	And ironstone.
Isaac Whitehouse, Prince's End, Tipton	Tipton Hall	Ditto	J. Taft.	
The New British Iron Co., Corngreaves, Birmingham.	Timbertree	Cradley Heath	W. B. Keen	And ironstone.
Woodall and Co., Tansey Green, Dudley	Tansey Green	Dudley.		
John Froggatt, Toll Gate, Bilston	Toll Gate	Bilston.		
The Stour Valley Coal and Iron Co., West Bromwich.	Union	West Bromwich	B. Cox.	
Harvey and Fithern, Upper Gornal, Dudley.	Upper Gornal	Dudley.		
Cartwright and Co., ditto ditto	Ditto	Ditto	T. Harris.	
W. H. Waterfield and Co., ditto ditto	Ditto	Ditto.		
The Victoria Colliery Co., Tividale, Tipton.	Victoria	Tipton	J. Price.	
W. W. Riddell, Aldridge, Walsall	Ditto	Aldridge	J. Thompson	And ironstone.
Henry Hunt, King's Hill, Wednesbury	Vicarage	Wednesbury.		
The Walsall Wood Colliery Co., Walsall	Walsall Wood	Walsall.		
J. Addenbrooke and Co., Rough Hay, Darlaston.	Woodwell	Bloxwich	T. Parton	Ironstone.
The Wyrley Cannock Colliery Co., Wyrley, Walsall.	Wyrley Cannock	Wyrley	J. Dainty	And ironstone.
Bradley Brothers and Southan, Bilston	Wallbutts	Bilston	W. Grove, jun.	And ironstone.
The Bilston Iron Co., ditto	Waterloo	Ditto	T. Roper.	
Smith and Roe, Wolverhampton road, Bilston.	Wolverhampton Road	Ditto.		
Phillip Williams and Sons, Wednesbury bury Oak, Tipton.	Wednesbury Oak	Tipton	E. Cox	And ironstone.
The Willingsworth Colliery Co., Ocker Hill, Tipton.	Willingsworth	Ocker hill	T. Roper.	
The Patent Shaft and Axletree Co., Wednesbury.	Wednesbury Old Park	Wednesbury	J. R. Cooksey.	
Mines Drainage Commissioners, Wolverhampton.	Windmill End	Dudley		Pumping Station.
Thomas Powers, Church Lane, West Bromwich.	White's Farm	West Bromwich	J. Ritson.	
Farley and Duce, West Bromwich	Whyley	Ditto	T. Parton.	
Isaac Armstrong, Steelhouse Lane, Wolverhampton.	Wolverhampton (part)	Wolverhampton.		
Leighton and Co., ditto ditto	Ditto „	Ditto.		
Cooper and Potts, ditto ditto	Ditto „	Ditto.		
Galloway and Co., ditto ditto	Ditto „	Ditto.		
The Willenhall Colliery Co., Willenhall	Willenhall	Willenhall.		
Mark Gallear, ditto ditto	Ditto New	Ditto.		
The Earl of Dudley, Priory Offices, Dudley.	Wallows	Brierley Hill	J. Skidmore	And ironstone.
John Raybould, Brierley Hill	Ditto (part)	Ditto	R. Groucott	And ironstone.
The West Cannock Colliery Co., Hednesford, Stafford.	West Cannock	Hednesford	J. Pease.	

List of Mines—*continued.*

Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager.	Remarks.
James Timmins, Hall End, West Bromwich.	Wednesbury New Mine	West Bromwich.		
Isaac Law & Co., Hill Top, West Bromwich.	Witton Lane	Ditto.		
The Whitehall Colliery Co., Cradley Heath, Brierley Hill.	Whitehall	Cradley Heath	T. H. Lloyd.	
William Mills, Waterfall Lane, Old Hill	Waterfall Lane	Old Hill.		
Mines Drainage Commissioners, Wolverhampton.	Waterfall Lane	Ditto		Pumping station.
Harris and Pearson, Amblecote, Stourbridge.	Wittymoor	Stourbridge	J. Groucott.	
G. and R. Thomas, Hatherton, Walsall	Wood Farm	Bloxwich	G. Povey.	
Cochrane and Co., Woodside, Dudley	Yew Tree	Rowley Regis	T. Oakes.	
	COUNTY OF WORCESTER.			
The Blakeley Hall Colliery Co., Oldbury	Blakeley Hall	Oldbury	F. W. Peacock	Sinking.
The Broadwell Colliery Co., Oldbury	Broadwell	Ditto	T. Wood.	
The Churchbridge Colliery Co., Oldbury	Bircheyfield	Ditto	T. H. Lloyd	And Ironstone.
W. Turner, Netherton, Dudley	Bumble Hole	Dudley	J. Williams.	
Smith Brothers, Blowers Green, Dudley	Blowers Green	Ditto	E. Davis.	
D. Skidmore, Old Buffery, ditto	Buffery Old (part)	Ditto	J. R. Norris.	
J. Marsh, ditto ditto	Ditto	Ditto	Ditto.	
W. Wright ditto ditto	Ditto	Ditto	Ditto.	
Shaw and Russell, ditto ditto	Ditto	Ditto	Ditto.	
F. Bradley ditto ditto	Ditto	Ditto	Ditto.	
Barker and Co., ditto ditto	Ditto	Ditto	Ditto.	
B. Martin and Co., ditto ditto	Ditto	Ditto	Ditto.	
B. Raybould and Co., ditto ditto	Ditto	Ditto	Ditto.	
Thomas Broughall, Baptist End, ditto	Baptist End	Ditto.		
Baker and Co., Dudley Road, Oldbury	Brades New	Oldbury.		
Thomas Aston, Mamble, Bewdley	Buckets Leasow	Bewdley.		
Earl of Dudley, Priory Offices, Dudley	Coneygre (part)	Tipton	T. Latham.	
Joseph King and Co., Netherend, Stourbridge.	Cradley Park	Cradley	R. Calderwood.	
The Cradley Colliery Co., ditto ditto	Cradley	Ditto	Ditto.	
Noah Hingley and Sons, Primrose Hill, Dudley.	Dudley Wood	Netherton	W. Davis	And Ironstone.
Harper and Moores, Lower Delph, Stourbridge.	Delph, Lower	Cradley	R. Groucott.	
Messrs. Pratt and Jones, Furnace Yard, Oldbury.	Furnace Yard	Oldbury	J. Tomson.	
Rufford and Co., Hungary Hill, Stourbridge.	Hungary Hill	Stourbridge	J. Gauden.	
Fisher and Co., Hayes, Stourbridge	Hayes	Ditto	R. Groucott.	
Timmis Brothers, Hill's Field, Lye, Stourbridge.	Hill's Field	Ditto	G. H. Timmis.	
The Homer Hill Colliery Co., Cradley, Brierley Hill.	Homer Hill	Cradley	J. Broughall	And Ironstone.
New British Iron Co., Corngreaves, Birmingham.	Hawne, New	Halesowen	W. B. Keen.	
Hickman and Co., Lye, Stourbridge	Hobbidob	Lye Waste	E. Green.	
W. Wyatt, Bayton, Bewdley	Mill Farm	Bayton.		
Thomas Aston, Mamble, Bewdley	Mamble	Mamble.		
George Glaze and Son, Millfield, Dudley	Millfield	Dudley		Ironstone.
J. and G. Dunn, Netherton, Dudley	Manor	Halesowen	G. H. Dunn.	
J. and G. Dunn, Netherton, Dudley	Netherton	Dudley	G. H. Dunn.	
M. and W. Grazebrook, ditto ditto	Ditto, Old	Ditto	T. Woolley	And ironstone.
Nicklin and Whitehead, Newbury Lane, Oldbury.	Newbury Lane	Oldbury	W. North.	
Joseph King and Co., Netherend, Stourbridge.	Netherend	Stourbridge	R. Calderwood	And ironstone.
W. Davis, The Rock, Bewdley	Old Hall	Bewdley.		
R. Mills and Co., Holly Hall, Dudley	Old Park (part)	Dudley	J. Mills.	
S. Garratt and Sons, Queen's Cross, Dudley.	Ditto	Ditto	T. Green.	
The Oakham Colliery Co., Dudley	Oakham	Ditto	J. Davis.	
Henry Hall, Brierley Hill, Dudley	Old Level	Brierley Hill	J. Williams.	
Phillips and McEwen, Parkhead, Dudley	Parkhead Furnace	Dudley	E. Davis.	
S. Garratt and Sons, Queen's Cross, Dudley.	Parkhead	Ditto	T. Green.	
The Dudley Colliery Co., Dudley	Prince of Wales	Ditto	G. Taylor.	
Booth and Hardcastle, Abberley, Stourport.	Pool House	Stourport.		
Lewis Brothers, Penn Hall, Tenbury	Penn Hall	Tenbury.		
The Alston Colliery Co., Oldbury	Round's Green	Oldbury	T. E. Lloyd.	
Andrew Beavons, Eve Hill, Dudley	Russell's Hall (part)	Dudley.		
John Waterfield, Himley Road, Dudley	Ditto	Ditto.		
Fred. Rogers, The Rock, Bewdley	Rockmoor	Bewdley.		

List of Mines—*continued.*

Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager.	Remarks.
The Dudley Colliery Co., Dudley	Springfield	Dudley	G. Taylor.	
The Earl of Dudley, Priory Offices, Dudley.	Saltwells	Ditto	J. Skidmore	And ironstone.
Mansell and Davies, Newbury Lane, Oldbury.	Samson	Oldbury	J. Price	And ironstone.
Clifton and Collins, Langley Green, Oldbury.	Speedwell	Ditto	E. Davis.	
John Carlyle, Tansley Hill, Dudley	Tansley Hill	Dudley.		
The Witley Colliery Co., Halesowen	Witley	Halesowen	J. Johnson	Sinking.
Cochrane and Co., Woodside, Dudley	Woodside	Dudley	T. Oakes	And ironstone.
The Churchbridge Colliery Co., Oldbury	Whiteheath	Oldbury	T. H. Lloyd	And ironstone.

LIST of the FIRECLAY MINES in the SOUTH STAFFORDSHIRE AND WORCESTERSHIRE DISTRICT for the Year 1878.

Owner or Company and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager.	Remarks.
	COUNTY OF STAFFORD.			
John Hall and Co., Amblecote, Stourbridge.	Amblecote	Stourbridge	T. Skidmore.	
Trotter, Haines, and Co., Brettell Lane, Stourbridge.	Brettell Lane	Brierley Hill	R. Groucott.	
G. K. Harrison, Lye, Stourbridge	Ditto	Ditto	W. Wiles.	
Harris and Pearson, Amblecote, Stourbridge.	Ditto	Ditto	J. Groucott.	
The Earl of Dudley, Priory Offices, Dudley.	Coneygre	Tipton	T. Latham.	
Edward Bowen, Clattershall, Stourbridge	Clattershall	Brierley Hill.		
Pearson and Co., Amblecote, Stourbridge	Crown	Stourbridge	J. Groucott.	
Hickman and Co., Lye, Stourbridge	Delph	Brierley Hill	E. Green.	
Harris and Pearson, Amblecote, Stourbridge.	Ditto	Ditto	J. Groucott.	
E. J. and J. Pearson, Delph, Stourbridge	Ditto	Ditto	R. Groucott.	
Mrs. Gibbons, Dibdale, Dudley	Dibdale	Dudley	B. Gibbons.	
Trustees of R. Homer, Freehold, Stourbridge.	Freehold	Brierley Hill	R. Deeley.	
John Colbourn, Woodsetton, Dudley	Foxyards (part)	Tipton.		
The Earl of Dudley, Priory Offices, Dudley.	Ditto	Ditto	T. Latham.	
John Hall and Co., Amblecote, Stourbridge.	Moor Lane	Brierley Hill	T. Skidmore.	
John Walker, Oak Farm, Dudley	Oak Farm	Kingswinford	R. Groucott.	
The Himley Fire-brick Co., Oak Farm, Dudley.	Stourbridge Extension	Ditto	T. Brettell.	
Isaac Whitehouse, Bear Hall, Tipton	Tipton Hall	Tipton	J. Taft.	
The Earl of Dudley, Priory Offices, Dudley.	Thorns	Brierley Hill	E. Clarke.	
Harper and Moores, Lower Delph, Stourbridge.	Ditto	Ditto	R. Groucott.	
Mobberley and Bayley, Thorns, Brierley Hill.	Ditto	Ditto	W. Deeley.	
New British Iron Co., Corngreaves, Birmingham.	Timbertree	Old Hill	W. B. Keen.	
Cartwright and Co., Upper Gornal, Dudley	Upper Gornal	Dudley	T. Harris.	
W. H. Waterfield and Co., ditto ditto	Ditto	Ditto.		
Harris and Pearson, Amblecote, Stourbridge.	Wittymoor	Stourbridge	J. Groucott.	
	COUNTY OF WORCESTER.			
Harper and Moores, Lower Delph, Stourbridge.	Delph, Lower	Brierley Hill	R. Groucott.	
Fisher and Co., Hayes, Stourbridge	Hayes	Cradley	Ditto.	
Rufford and Co., Hungary Hill, Stourbridge.	Hungary Hill	Stourbridge	J. Gauden.	
Timmis Brothers, Hill's Field, Stourbridge	Hill's Field	Lye	G. H. Timmis.	
Hickman and Co., Lye, Stourbridge	Hobbidob	Lye Waste	E. Green.	
Ditto ditto ditto	Lye	Lye	Ditto.	
G. K. Harrison, ditto ditto	Lunts	Ditto	W. Wiles.	
Ditto ditto ditto	Netherend	Cradley	Ditto.	
E. J. and J. Pearson, Delph, ditto	Waste Bank	Lye	R. Groucott.	

List of the Metalliferous Mines in the South Staffordshire and Worcestershire District for the Year 1878.

Owner or Company and Postal Address.	Name of Mine.	Where situated.
	SILURIAN LIMESTONE.	
	County of Stafford.	
T. Matthews, Birchills, Walsall	Birchills	Walsall.
T. and G. Strongitharm, Daw End, Walsall.	Daw End	Ditto
John Bagnall and Sons, Golds Hill, West Bromwich.	Groveland	Dudley Port.
E. Crapper and Co., Hatherton, Walsall	Hatherton	Walsall.
The Patent Shaft and Axletree Co., Wednesbury.	Wednesbury Old Park	Wednesbury.
E. Crapper and Co., Walsall	Portland Street	Walsall.
The Earl of Dudley, Priory Offices, Dudley.	Wren's Nest, East	Dudley.
Ditto ditto ditto	Ditto, West	Ditto.
W. and C. E. Bradley, Tividale Hall, Tipton.	Tividale Hall	Tipton.
The Earl of Dudley, Priory Offices, Dudley.	Coneygre	Ditto.
	County of Worcester.	
The Earl of Dudley, Priory Offices, Dudley.	Castle Mill	Dudley.
Ditto ditto ditto	Castle Fields	Ditto.
Ditto ditto ditto	East Castle	Ditto.

Mr. Moore's Report.

Report of the Inspector of Mines and Collieries in the Eastern District of Scotland for the Year ended 31st December 1878. — By Ralph Moore, Esq.

Rutherglen, Glasgow,
24th March 1879.

Sir,

I have the honour to lay before you a Report of my proceedings, as Inspector of Mines, in carrying out the Coal Mines Regulation Act, and the Metalliferous Mines Act, in this district, for the year 1878.

During this year my assistant, Mr. Robson, and myself were fully employed in these duties. We made 482 visits to mines, 238 of which were underground, travelled 19,600 miles, wrote reports, and kept up an extensive correspondence.

The Coal Mines Regulation Act, 1872, continues to work very fairly, and upon the whole is effecting an increased saving of life. This is principally due to the greater uniformity of regulations, which helps to promote better discipline and division of labour. The saving of life is specially noticeable in accidents by falls of roof and sides, which, in this district, had been least improved by former Acts; and taking the number of lives lost during the five years succeeding the passing of the present Act, and the ten years preceding, there seems to be a decided decrease in the death-rate from this cause. During the period 1873–77, one life was lost for every 365,760 tons of coal raised, while during the periods of 1863–67 and 1868–72, only 324,726 and 322,090 tons were raised per life lost respectively. During the past year 353,562 tons were raised per life lost. In order to comply with the 16th General Rule, the owners cause the miners to secure the roof and sides of their working places; but they employ officials to visit each working place three times a day to see that the miners do not fail to secure them; nevertheless, I am satisfied that if these officials, instead of merely visiting the men, were to take charge of the roof and set up props themselves, there would be a still greater saving of life, and it appears to me that a full compliance with the 16th General Rule requires this to be done. No doubt many of the miners are experienced men, but it as often as otherwise happens that these men are the sufferers. This only confirms my argument; because the miner is paid so much per ton of mineral raised, which includes all payment for setting up props and otherwise supporting the roof, and he in this way, trusting to his experience to detect danger, frequently delays to put up the necessary props until a more convenient time, and often till it is too late.

The owners, notwithstanding the dull times, are following up the improvements in mining appliances. Additional ventilating fans have been put up, and there are now 91 in the district, whereas seven years ago there was only one. It will be seen by reference to the table of collieries and persons employed that Blantyre and Auchenraith collieries have each over 150,000 cubic feet of air per minute, and that many other collieries have quantities varying from 40,000 to 80,000 cubic feet per minute. The mode of distribution is also improving, as will be seen by a reference to the same table. Haulage by machinery underground is becoming more frequently employed, the endless-rope being preferred to the tail-rope. Coal-cutting machines are at work at Bothwell Park, Auchenraith, West Calder, and Penston in East Lothian. These machines are all worked by compressed air, and are giving favourable results. All these improvements tend to diminish the number of persons employed underground, and may be expected to increase the quantity of coal raised per life lost.

Of the new collieries near Hamilton 12 are now raising coal, viz.: Clyde, Barncluith, Bent, Cadzow, Allanshaw, Auchenraith, Blantyre, Udston, Eddlewood, Craighead, Bothwell Park, and Greenfield. These are, doubtless, the most advanced in the district as regards machinery and general arrangements. They employ 3,264 persons, and last year raised 1,541,584 tons of coal, being 472 tons per person employed, as compared with 339 the average of the district and 307 the average of the kingdom. 909,000 cubic feet of air per minute are sent into the workings for the 2,736 men who are employed underground. It may give a better idea of this large quantity of air by stating, that if it were all confined to a passage 20 feet wide by 20 feet high, it would travel at the rate of nearly 26 miles per hour. In these collieries there were six fatal accidents, causing the death of 11 persons, being 140,144 tons raised for every life lost. There were also 25 non-fatal accidents, causing

injury to 28 persons. Of the fatal accidents, none were caused by explosions; three by falls of roof and sides, one in shafts, and two miscellaneous underground. One of these, in which six persons were killed, was caused by overwinding. Three of the above collieries, viz., Blantyre, Cadzow, and Greenfield, are worked solely with safety lamps, but in the others safety lamps are used only where pillars are being worked away and in special cases.

The quantity of minerals raised, under the Coal Mines Regulation Act, was 13,100,921 tons, and the persons employed 40,098, being practically the same as in 1877.

There were 63 fatal accidents causing the death of 71 persons, and 233 cases of personal injuries were reported to me.

There was one fatal explosion of fire-damp, which caused the death of two persons, an overman and a fireman. These two men had gone into a part of the workings, which had been standing for twelve months, to measure some rails, and had taken both safety lamps and naked lights with them. They were longer away than was expected, and the attention of the other overman was directed to the matter. He got assistance, went in, and found them both lying dead. There had been a slight explosion of gas within 50 yards of the face. It is difficult to conceive anything more stupid than the conduct of these men, who were not common workmen, but officials, in going into a disused working and using open lights.

There were other 19 separate explosions, all of which were examined into. They injured 23 persons, and occurred as follows:—

January 14.—At Maryville. A fireman ignited gas while making the inspection in terms of General Rule 2. It was suspected he had a naked light with him. He was off work three weeks.

February 27.—At Addiewell (shale pit). The overman went into a disused road, off the aircourse, with a naked light, and kindled some gas, which burned him and two brushers who were working near. They were off work 32, 19, and 8 days respectively.

April 1.—At Bredisholm. A drawer, on going into his place in the morning, kindled gas at the face of brushing, which burned the collier, who was close by. Was off work three weeks.

April 1.—At Motherwell. A collier kindled gas in his place in the morning. Want of brattice. Naked lights. He was off work 61 days.

April 30.—At Blairhall (ironstone pit). A miner ignited gas at a hitch on the rise side of his working place. He was off work 90 days.

May 10.—At Eddlewood. Two firemen were examining the disused workings in advance of surveyors. They had both safety lamps and naked lights, and the latter ignited gas at a face standing on a hitch and burned them. They were off work 39 and 45 days respectively.

May 13.—At North Motherwell. A collier was burned by gas which kindled at his naked light at the face. A "fall" in the place obstructed the air-current. He ought to have had a safety lamp. Was off work three weeks.

May 13.—At Blantyre. A fireman, during the night, ignited some gas which had lodged above the wooden roof of the lamp cabin in the Ell coal. He was never off work.

May 14.—At Gartness. A collier kindled gas on a drawing road. He carried a "Clanny" lamp, which was found with the glass broken. He was off work four days.

May 17.—At Addiewell (shale pit). A fireman burned while making the morning inspection. He said he had lost his light, and struck a match to re-light his safety lamp, when an explosion took place.

May 27.—At Chapelside, Airdrie. The pit was idle that day, and an underground engineman went, without authority, into one of the faces which had not been examined, and ignited some gas. Naked lights. He was off work 42 days.

June 18.—At North Motherwell. A collier burned at face. Brattice too far back. Naked lights. He was off work nearly five weeks.

July 5.—At Rosehall. A collier, acting as fireman, went into a disused road, and was burned. Naked lights. He was off work 24 days.

July 24.—At Broomfield. A fireman ignited gas in a road, off the aircourse. Naked lights. He was off work 21 days.

July 27.—At Mill pit, Airdrie. A collier was driving a communication mine and kindled a blower with his naked light. Brattice too far back. He was off work four days.

August 19.—At Addiewell (shale pit). A fireman exposed a naked light where he had just cleared away, as he thought, some gas from a working place. He and a miner were burned, and were off work 20 and 13 days respectively.

October 24.—At Chapelside. A fireman went into a disused road with a naked light and was burned. Off work three weeks.

November 26.—At Broomfield. A brusher went with a naked light into a road, which had not been inspected that morning, and was burned. He had no authority for going into this place, but was sent within thirty yards of it. He was off work six weeks.

December 26.—At Roughcraig. A collier went into his place with a naked light, after being told by the fireman that there was a little gas in it. The fireman was on his way with brattice to dispel the gas when the explosion happened.

The explosions were fewer than the average of former years. It would be well, however, for owners, managers, and all concerned to bear in mind that during the last two years there has been a great loss of life from explosions throughout the kingdom. The same causes are still at work, and only by increased vigilance and discipline, accompanied by the best appliances, can they have a chance of averting such accidents. It is a difficult matter to account for large explosions, and it often happens that they occur in those collieries where a great quantity of air is in circulation. It must be remembered that fresh air is as indispensable for combustion as the gas itself, and the intensity of these explosions is assisted by the large airways through which large quantities of air are freely drawn in for the combustion of the gas and dust which is raised by the explosion. When sudden outbursts of gas, or temporary falls, or accidents occur, by which accumulations of gas are possible, the gas cannot apparently be diluted with sufficient speed to be harmless, and if it gets ignited the very large airways supply fuel to the fire. The recent fatal explosions in other parts of the kingdom, where safety lamps were solely used, seem to point out that safety lamps are unable to prevent their recurrence. Still I believe we are not entitled to neglect any precaution which will lessen their frequency, and I am persuaded that the use of safety lamps should be made imperative in all mines where fire-damp is found. The prohibition of naked lights would certainly have prevented every explosion which has occurred in this district during the past year, and indeed the explosions which would then happen would be those due to defective safety lamps or to imperfections in the principle of the lamp itself.

Six men were killed by one accident. An engineman took the cage, upon which they were ascending, up to the pulley. He appears to have shut off the steam and so far decreased the speed, for the rope did not break, and the cage, although broken, remained attached to it. The six men, however, had either jumped off or slid off the cage, and fell to the bottom. One man remained on, and was removed uninjured. The engineman was tried at the Glasgow Assizes for neglect of duty, but a verdict of "not proven" was returned.

Notwithstanding this accident, I am not prepared to advise the adoption of any of the various so-called "safety hooks" which are advertised. Winding engines are thoroughly under control, and with a careful engineman an accident of this kind should not occur.

The following prosecutions were made for offences against the Mines Act :—

January 8.—At Hamilton Sheriff Court, a manager charged with failing to have a competent person appointed to inspect working places. Fined 2*l.* 2*s.* or seven days imprisonment.

January 12.—A miner charged with using an open lamp where safety lamps were used in Blantyre colliery. Acquitted.

January 12.—Two miners charged with smoking tobacco and having match paper in their possession in Blantyre colliery. Each fined 1*l.* 5*s.* or 14 days imprisonment.

April 29.—An engineman at Bothwell Park Colliery charged with allowing a boiler to become dry, and, when in that condition, pumping water into it whereby it burst. Fined 1*l.* or 14 days imprisonment.

May 10.—A miner at Allanton colliery charged with smoking tobacco where safety lamps were used. Fined 1*l.* 10*s.* or 14 days imprisonment.

May 24.—A boy at Allanton colliery charged with opening a locked safety lamp. Convicted and admonished.

May 24.—An owner and a manager charged at the Airdrie Sheriff Court with a contravention of 20th section of the Coal Mines Regulation Act. Both found guilty, and each fined 1*l.* or three days imprisonment.

May 28.—An owner and a manager charged with contravention of the 20th section of the Coal Mines Regulation Act. Owner fined 5*l.* or 14 days, and manager fined 2*l.* or seven days imprisonment.

May 28.—An owner and a manager charged with contravention of the 20th section of Mines Act. Fined 5*l.* or 14 days, and 2*l.* or seven days respectively.

June 20.—A miner charged with having matches in his possession where safety lamps were used in Cadzow Colliery. Fined 2*l.* or one month's imprisonment.

June 20.—An engineman charged with permitting colliers to descend a pit at Clackmannan when it was idle and no inspection had been made in terms of General Rule 3. Fined 30*s.*

July 30.—A fireman charged with failing to see that two colliers were not securing their working place at Auchenraith. Acquitted.

July 19.—A miner charged with contravening General Rule 8, sub-division *d.*, at Newbattle Colliery. Fined 1*l.* or 10 days imprisonment.

July 30.—A drawer charged with having lucifer matches in his possession, where safety lamps were required to be used, in Southfield Colliery. Fined 1*l.* or 20 days imprisonment.

September 6.—A fireman charged with having supplied a workman with an unlocked safety lamp in Bothwell Park Colliery. Fined 10*s.* or three days imprisonment.

November 26.—An owner charged with contravention of 20th section of the Coal Mines Regulation Act. Convicted and admonished.

December 13.—A collier charged with smoking tobacco where safety lamps were used, in Greenfield Colliery. Fined 10*s.* or 24 hours.

The coal and iron trades were in a more depressed condition than during any of the preceding eight years, and as a natural consequence the miners' wages have been reduced. I am furnished with a list of prices which were obtained last year for coals, free on board at Glasgow, which I have given in an appendix. The highest price for Ell or household coal was 9*s.* 3½*d.* per ton; splint coal 8*s.*; main coal 7*s.* 4*d.*; the lowest prices were 6*s.*, 6*s.* 6*d.*, and 5*s.* 6*d.* per ton respectively.

Miners' wages which in January last were nominally 4*s.* 6*d.* per day, were reduced to about 3*s.* 9*d.* to 3*s.* 6*d.*, and in the ironmasters' collieries a little less. On the whole they worked steadily during the year, but did not get full work, owing to the dull trade.

I have as usual given the following tables:

(1). A complete list of the mines in my district, showing where they are situated, the names of the certificated managers, number of pits, size of each pit, depth; name of seam worked and mode of working, number of persons working, the amount of ventilation, the length and size of airways, the accidents at each colliery, and the ventilating power. This table is chiefly compiled from the January returns, and gives at a glance much useful information as to the size and condition of the mines in the district. It has cost my assistant, Mr. Robson, much labour, and will well repay an attentive perusal. The mere names of the collieries give no clue to their magnitude, whereas by adding, in a concise form, the above information the progress of improvement is made manifest.

(2). The number of firms raising large quantities of coals, showing that the quantities raised by firms do not differ much from last year.

(3). A table showing the accidents and deaths for the last three years.

(4). A table showing the non-fatal accidents during the last three years, which shows that the accidents for the last year are much below the average.

(5). A table analysing the falls of roof and sides, which shows that the accidents in the collieries worked by "long wall" and "stoop and room" are about equal; and as the quantities of coal worked by each method are nearly the same, it shows that as far as this year is concerned each system is about equally safe.

(6). A table showing the quantity of coal raised in each county, the modes of working, and the deaths in each.

(7). A table showing the comparative safety of certain collieries as compared with the district, showing that they are safer than the whole district, but that this year they are under the Durham standard of safety.

(8). A table showing the wages made by two colliers during the year, taken from the pay sheet, and showing that they hewed and filled 1,173 and 1,543 tons of coal in 301 and 297 days for 64*l.* 7*s.* 4*d.* and 56*l* 17*s.* 4*d.* respectively, being an average of 4*s.* 3¼*d.* and 3*s.* 9¾*d.* for each day worked, or 4*s.* 1¼*d.* and 3*s.* 7½*d.* per day respectively for the 313 working days in a year.

(9). A table showing the prices realized for coals at the Broomielaw Harbour, Glasgow.

METALLIFEROUS MINES.

There have been three accidents in Metalliferous Mines, one by falling down the shaft, and two by falls of rock. They are entered in the lists annexed.

I have, &c.,

The Right Hon. R. A. Cross, M.P., RALPH MOORE.
Secretary of State for the Home Department,
&c. &c.

	1878.	1877.
Number of Mines of all kinds under the Coal Mines Regulation Act, 1872	348	351
„ Shafts of all kinds	695	691
„ Collieries	293	300
„ Coal pits	611	608
„ Companies working coal	191	200
Of whom 1 firm raised over	480,000 tons	1 firm raised over 500,000 tons.
1 firm „ „	450,000 „	
		2 firms „ „ 400,000 „ each
2 firms „ „	350,000 „ each	1 firm „ „ 350,000 „
1 firm „ „	300,000 „	2 firms „ „ 300,000 „ each
2 firms „ „	250,000 „ each	
5 „ „ „	200,000 „ „	6 firms „ „ 200,000 „ each
7 „ „ „	150,000 „ „	5 „ „ „ 150,000 „ „
9 „ „ „	120,000 „ „	8 „ „ „ 120,000 „ „
19 „ „ „	80,000 „ „	20 „ „ „ 80,000 „ „
37 „ „ „	40,000 „ „	39 „ „ „ 40,000 „ „
107 „ „ under	40,000 „ „	116 „ „ under 40,000 „ „
Greatest quantity of coal put out of a single shaft	229,000 tons	136,000 tons
Ditto ditto out of a pair of shafts		180,000 „

QUANTITY of MINERALS raised.

	1878.	1877.	Increase.	Decrease.
	Tons.	Tons.	Tons.	Tons.
Coal	11,667,559	11,452,373	215,186	—
Fire-clay	184,459	154,804	29,655	—
Ironstone	713,277	893,222	—	179,945
Shale	535,626	581,351	—	45,725
Total	13,100,921	13,081,750	19,171	—

PERSONS EMPLOYED.

	1878.	1877.	Increase.	Decrease.
Underground—				
Boys of 10 and under 12	—	—	—	—
Boys of 12 and under 13	302	291	11	—
Males of 13 and under 16	3,671	3,762	—	91
Males above 16	29,339	28,779	560	—
Total underground	33,312	32,832	480	—
Above ground—				
Boys of 10 and under 13	10	8	2	—
Girls of 10 and under 13	2	4	—	2
Males of 13 and under 16	407	397	10	—
Females of 13 and under 16	75	60	15	—
Women above 16	604	583	21	—
Males above 16	5,688	5,885	—	197
Total above-ground	6,786	6,937	—	151
Total number employed	40,098	39,769	329	

Fatal Accidents and Deaths.

	1878.		1877.		1876.	
	Accidents.	Deaths.	Accidents.	Deaths.	Accidents.	Deaths.
Explosions	1	2	6	212	1	2
Falls of roof and sides	35	36	32	35	36	38
In shafts	13	18	15	16	16	16
Miscellaneous underground	7	8	12	15	9	9
Miscellaneous on surface	7	7	5	5	6	13
Total	63	71	70	283	68	78

Number of Persons Injured by Non-Fatal Accidents.

	1878.	1877.	1876.
By explosions	23	41	41
By falls of roof and sides	117	137	132
In shafts	11	18	22
Miscellaneous underground	52	49	68
Miscellaneous on surface	30	35	32
Total	233	280	295

Analysis of "Deaths" from "Falls of Roof and Sides" in Coal Workings during 1878.

	Mode of Working.		
	Long Wall.	Stoop and Room.	Total.
Falls of coal at face	1	4	5
" " "stoops"	—	3	3
" of head coal	—	1	1
" of roof at face	7	3	10
" of "brushing" at face	7	—	7
" of roof at stoops	—	4	4
" " in roads	1	2	3
Total	16	17	33

Accidents and Quantities of Coal in each County.

County.	Output of coal in 1878.			Lives lost in 1878.												Total Lives lost in 1878.	Total Lives lost in 1877.
				In Long Wall.						In Stoop and Room.							
	Worked by Long Wall Method.	Worked by Stoop and Room Method.	Total.	Explosions.	Falls.	In Shafts.	Miscellaneous.	On Surface.	Total.	Explosions.	Falls.	In Shafts.	Miscellaneous.	On Surface.	Total.		
	Tons.	Tons.	Tons.														
Lanark (Eastern)	2,911,775	4,771,820	7,683,595	—	6	10	2	1	19	2	16	5	2	2	27	46	245
Stirling (Eastern)	674,368	18,000	692,368	—	1	1	–	1	3	—	–	–	–	–	—	3	3
Linlithgow	292,264	102,457	394,721	—	1	–	–	2	3	—	–	–	–	–	—	3	3
Edinburgh	422,525	302,597	725,122	—	–	–	–	–	–	—	–	–	2	–	2	2	7
Haddington	151,888	69,751	221,639	—	–	–	–	–	–	—	–	–	–	–	—	—	3
Fife	1,455,026	221,875	1,676,901	—	8	1	–	1	10	—	1	–	–	–	1	11	8
Clackmannan, Kinross, Perth, Sutherland	213,213	60,000	273,213	—	–	–	–	–	—	—	–	–	–	–	—	—	2
	6,121,059	5,546,500	11,667,559	—	16	12	2	5	35	2	17	5	4	2	30		
										—	16	12	2	5	35		
				In 1878						2	33	17	6	7	65	65	
				In 1877						212	27	15	12	5	271		271

Table showing the Comparative safety of a group of Lanarkshire Collieries, as compared with the whole District, with Durham, and with the United Kingdom in 1878.

	Persons employed.	Coal raised.	Deaths from Accidents.					
			Explosions.	Falls.	In Shafts.	Miscellaneous.	On Surface.	Total Lives lost.
Collieries in the parishes of Dalzell, Hamilton, Dalserf, Cam'nethan, and Carluke	9,728	Tons. 4,506,154	2	13	5	2	2	24
The above per 10 million tons	21,588	10,000,000	4·4	28·8	11·1	4·4	4·5	53·2
Average of whole district	29,498	10,000,000	1·8	28·3	14·5	5·1	6·0	55·7
Durham	34,465	10,000,000	·8	24·3	3·0	6·1	4·5	38·7
United Kingdom	32,603	10,000,000	40·1	32·2	7·6	11·0	5·9	96·8

WAGES EARNED by a first-class Collier employed in the Solid Workings of the Ell Coal in a Wishaw Colliery during the Year 1878.

Pay ending	Days wrought.	Tons worked.	Rate per Ton.	Total Amount.	Deductions.				Balance Paid.
					Smith.	Doctor.	School.	Total.	
1878.		Tns. cwts.	s. d.	£ s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.
January 9	5	23 2	1 3	1 8 10½	0 6	0 4	0 6	0 1 4	1 7 6½
„ 23	12	45 12	„	2 17 0	0 6	0 4	0 6	0 1 4	2 15 8
February 6	12	50 12	„	3 3 3	0 6	0 4	0 6	0 1 4	3 1 11
„ 20	12	45 5	„	2 16 6¾	0 6	0 4	0 6	0 1 4	2 15 2¾
March 6	12	44 10	„	2 15 7½	0 6	0 4	0 6	0 1 4	2 14 3½
„ 20	12	12 5 33 6	1 „ 1½	2 12 9¼	0 6	0 4	0 6	0 1 4	2 11 5¼
April 3	12	45 8	„	2 11 0¾	0 6	0 4	0 6	0 1 4	2 9 8¾
„ 17	12	46 3	„	2 11 11	0 6	0 4	0 6	0 1 4	2 10 7
May 1	12	44 8	„	2 9 11¼	0 6	0 4	0 6	0 1 4	2 8 7¼
„ 15	9	35 7	„	1 19 9	0 6	0 4	0 6	0 1 4	1 18 5
„ 29	10	39 13	„	2 4 7¼	0 6	0 4	0 6	0 1 4	2 3 3¼
June 12	12	45 16	„	2 11 6¼	0 6	0 4	0 6	0 1 4	2 10 2¼
„ 26	12	46 10	„	2 12 3¾	0 6	0 4	0 6	0 1 4	2 10 11¾
July 10	10	48 16	„	2 14 10¾	0 6	0 4	0 6	0 1 4	2 13 6¾
„ 24	11	42 0	„	2 7 3	0 6	0 4	0 6	0 1 4	2 5 11
August 7	12	42 5	„	2 7 6¼	0 6	0 4	0 6	0 1 4	2 6 2¼
„ 21	12	46 10	„	2 12 3¾	0 6	0 4	0 6	0 1 4	2 10 11¾
September 4	12	49 9	„	2 15 7½	0 6	0 4	0 6	0 1 4	2 14 3½
„ 18	12	48 1	„	2 14 0½	0 6	0 4	0 6	0 1 4	2 12 8½
October 2	12	46 10	„	2 12 3¾	0 6	0 4	0 6	0 1 4	2 10 11¾
„ 16	11	42 1	„	2 7 3½	0 6	0 4	0 6	0 1 4	2 5 11½
„ 30	12	48 7	„	2 14 4½	0 6	0 4	0 6	0 1 4	2 13 0½
November 13	12	43 18	1 0	2 3 10¾	0 6	0 4	0 6	0 1 4	2 2 6¾
„ 27	12	47 5	„	2 7 3	0 6	0 4	0 6	0 1 4	2 5 11
December 11	12	46 3	„	2 6 1¾	0 6	0 4	0 6	0 1 4	2 4 9¾
„ 25	12	44 17	„	2 4 10	0 6	0 4	0 6	0 1 4	2 3 6
„ 31	5	19 2	„	0 19 1	—	—	—	—	0 19 1
	301	1,173 1	—	66 2 0¼	13 0	8 8	13 0	1 14 8	64 7 4¼

WAGES of an average Collier employed in the Pillar Workings of a Wishaw Colliery (Ell Coal) during the Year 1878.

Pay ending	Days wrought	Tons worked	Rate per ton	Total Amount	Deductions.				Wages Paid
					Smith.	Doctor.	School.	Total.	
1878.		Tns. Cwts.	*d.*	£ *s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
January 9	6	26 19	10½	1 3 6¾	0 6	0 4	0 6	0 1 4	1 2 2¾
„ 23	12	60 10	„	2 12 11¼	0 6	0 4	0 6	0 1 4	2 11 7¼
February 6	12	62 8	„	2 14 7	0 6	0 4	0 6	0 1 4	2 13 3
„ 20	12	67 1	„	2 18 8	0 6	0 4	0 6	0 1 4	2 17 4
March 6	12	61 7	„	2 13 8	0 6	0 4	0 6	0 1 4	2 12 4
„ 20	10	16 7 32 5	„ 9	0 14 3½ 1 4 2¼	0 6	0 4	0 6	0 1 4	1 17 1¾
April 3	11	52 14	„	1 19 6¼	0 6	0 4	0 6	0 1 4	1 18 2¼
„ 17	12	62 12	„	2 6 11¼	0 6	0 4	0 6	0 1 4	2 5 7¼
May 1	12	59 3	„	2 4 4¼	0 6	0 4	0 6	0 1 4	2 3 0¼
„ 15	8	41 2	„	1 10 9¾	0 6	0 4	0 6	0 1 4	1 9 5¾
„ 29	8	37 18	„	1 8 5	0 6	0 4	0 6	0 1 4	1 7 1
June 12	12	66 0	„	2 9 6	0 6	0 4	0 6	0 1 4	2 8 2
„ 26	12	66 5	„	2 9 8¼	0 6	0 4	0 6	0 1 4	2 8 4¼
July 10	12	61 2	„	2 5 9¾	0 6	0 4	0 6	0 1 4	2 4 5¾
„ 24	11	50 11	„	1 17 10¾	0 6	0 4	0 6	0 1 4	1 16 6¾
August 7	12	68 3	„	2 11 1¼	0 6	0 4	0 6	0 1 4	2 9 9¼
„ 21	12	65 5	„	2 8 11¼	0 6	0 4	0 6	0 1 4	2 7 7¼
September 4	12	68 19	„	2 11 8½	0 6	0 4	0 6	0 1 4	2 10 4½
„ 18	12	73 6	„	2 14 11½	0 6	0 4	0 6	0 1 4	2 13 7½
October 2	12	65 0	„	2 8 9	0 6	0 4	0 6	0 1 4	2 7 5
„ 16	11	54 15	„	2 1 0¾	0 6	0 4	0 6	0 1 4	1 19 8¾
„ 30	11	57 13	„	2 3 2¾	0 6	0 4	0 6	0 1 4	2 1 10¾
November 13	12	62 2	8	2 1 4¾	0 6	0 4	0 6	0 1 4	2 0 0¾
„ 27	12	64 17	„	2 3 2¾	0 6	0 4	0 6	0 1 4	2 1 10¾
December 11	12	56 19	„	1 17 11½	0 6	0 4	0 6	0 1 4	1 16 7½
„ 25	12	55 19	„	1 17 3½	0 6	0 4	0 6	0 1 4	1 15 11½
„ 31	5	26 8	„	0 17 7	—	—	—	—	0 17 7
	297	1,543 10	—	58 12 0½	13 0	8 8	13 0	1 14 8	56 17 4½

TABLE showing the PRICES realised for SCREENED COALS at Glasgow Harbour during the Year 1878.

	Ell Coal.		Main Coal.		Splint Coal.	
	Highest	Lowest.	Highest.	Lowest.	Highest.	Lowest.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
January	8 1½	7 3	7 4	6 9	8 0	7 9
February	8 0	7 1	7 0	6 7	7 9	7 6
March	8 0	7 0	6 10	6 4	7 9	7 3
April	8 0	6 9	6 10	6 4	7 6	7 3
May	9 3½	6 11	6 10	6 3	7 6	7 0
June	7 6	7 0	6 7	6 3	7 9	7 0
July	7 9	6 9	6 10	6 0	7 6	7 0
August	7 6	6 3	6 6	6 0	7 4	7 0
September	7 6	6 3	6 6	5 10	7 0	6 9
October	7 6	6 3	6 6	5 9	7 0	6 9
November	7 0	6 0	6 4	5 6	6 9	6 6
December	7 3	6 3	6 4	5 6	6 9	6 6

The railway dues from Hamilton and Wishaw Collieries are about 2*s.* 6*d.* a ton, so that the price realised at the pit mouth will be 2*s.* 6*d.* less than the figures given above.

The screen bars are from $\frac{7}{8}$ths to an inch apart. 65 to 70 per cent. of the whole produce is screened coal.

The price of dross or screenings at the pit is from 1*s.* to 2*s.* 6*d.* per ton.

MINES CLASSED UNDER THE COAL MINES REGULATION ACT.

L 258. LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in MR. MOORE'S DISTRICT, consisting of the Counties of Clackmannan, Edinburgh, Fife, Haddington, Kinross, Linlithgow, Perth, Sutherland, and Parts of Lanark and Stirling, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
					Explosion of Firedamp.								
Dec. 30	1	Clydesdale -	Cam'nethan, Lanark.	Archibald Russell -	Robert Gillon -	Overman		- - -	2	–	–	–	–
					Alex. McMurdo -	Fireman.							
					Falls of Sides.								
Jan. 17	1	Dalzell -	Dalzell, Lanark -	J. McAndrew and Co. -	William Gatenbier	Collier -	15	At "stooping" while holing. Insufficient sprags.	–	1	–	–	–
„ 21	2	Muiredge -	Wemyss, Fife -	Bowman and Co. -	Alex. Brown -	Ditto -	27	At face, while passing in front. Long wall.	–	1	–	–	–
Mar. 26	3	Longlee -	Dalserf, Lanark -	Lesmahagow and Longlee Coal Co.	Thomas Creggan -	Ditto -	22	At "stooping" while holing. Want of sprags.	–	1	–	–	–
May 24	4	Auchenraith -	Blantyre, Lanark	Merry and Cuninghame -	John Mellon -	Ditto -	44	At face while holing in a 12-feet room. Want of sprags.	–	1	–	–	–
June 13	5	Braidholm -	Lesmahagow, do.	Nitshill and Lesmahagow Coal Co.	Robert Yuill -	Brusher	50	In a road, while drilling a hole to blast it. Long wall.	–	1	–	–	–
Aug. 5	6	Millburn -	Dalserf, Lanark -	N. Cochrane & Co. -	John McKee -	Collier -	17	At face, while holing after the coal was "shorn." Stoop and room.	–	1	–	–	–
Sept. 14	7	Ferniegare -	Hamilton, do. -	Archibald Russell -	James Hamilton -	Ditto -	62	At face. while relieving the coal after a shot. Stoop and room.	–	1	–	–	–
„ 26	8	North Motherwell	Dalzell, do. -	Merry and Cuninghame -	John Sanachen -	Ditto -		At "stooping," while filling his hutch a stone from the waste side fell off upon him.	–	1	–	–	–
Oct. 25	9	Allanton -	Hamilton, do. -	Austine & Co. - -	Thomas Parker -	Ditto -		At "stooping," while taking away his loaded tub of coal.	–	1	–	–	–
								Total by falls of sides -	–	9	–	–	–

List of the Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives Lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
					Falls of Roof.								
Jan. 21	1	Donibristle -	Aberdour, Fife -	Grieve & Nasmyth -	William Muir -	Collier -	17	At face, while filling a tub (coal roof). Stoop and room.	–	1	–	–	–
„ 23	2	Dunnikier -	Kirkcaldy, do. -	Walter Herd - -	James Knight -	Ditto -	41	At face. Long wall - - -	–	1	–	–	–
Feb. 20	3	Blantyre -	Blantyre, Lanark	Wm. Dixon (Limited) -	Patrick Ragan -	Brusher -	33	At face of "brushing." Long wall -	–	1	–	–	–
Mar. 13	4	Drumclair -	Slamannan, Stirling.	James Nimmo & Co. -	William Baxter -	Ditto -	36	At face, while taking down loose "brushing." Long wall	–	1	–	–	–
„ 16	5	Langbyres -	Shotts, Lanark -	Barr & Higgins - -	Alex. Keith -	Collier -	21	While "brushing," 2 feet from face. Long wall.	–	1	–	–	–
„ 20	6	Drumshangie -	New Monkland, Lanark -	Dumshangie Coal Co. -	Andrew Burns -	Ditto -		At face. Stoop and room - -	–	1	–	–	–
Apr. 12	7	Lathallan -	Kilconquhar, Fife	Thos. Brown & Sons -	Alex. Nicholson -	Ditto -	50	At face. Long wall - - -	–	1	–	–	–
„ 23	8	Boghead -	Bathgate, Linlithgow.	James Russell & Sons -	Francis Bonar -	Ditto -	15	At face. Long wall - - -	–	1	–	–	–
May 17	9	Bent - -	Hamilton, Lanark	Bent Colliery Co. (Limited)	Andrew Russell -	Roadsman -		On main road while repairing it. Stoop and room.	–	1	–	–	–
June 7	10	Roughrigg -	New Monkland, Lanark.	Robt. Forrester - -	Robert Carson -	Collier -	37	At face. Long wall - - - -	–	1	–	–	–
July 2	11	Wilsontown -	Carnwath, Lanark	Gavin Paul - -	William Brown -	Ditto -	28	At face. Long wall - - -	–	1	–	–	–
„ 23	12	Garriongill -	Cam'nethan, Lanark.	Coltness Iron Co. -	Daniel Scott -	Driver -	17	On drawing road. He knocked out some gears with his empty tub while taking it down a "brae." Stoop and room.	–	1	–	–	–
„ 25	13	Lumphinnans -	Ballingry, Fife -	Lumphinnans Iron Co. -	James Hannah -	Brusher -	38	While clearing the road-head of "brushing."	–	1	–	–	–
Aug. 5	14	Hill - -	Dalserf, Lanark -	James Smith & Son -	Thomas Walker -	Collier -		While drawing props from a stoop which was worked off.	–	1	–	–	–
Sept. 5	15	Lochgelly -	Auchterderran, Fife.	Lochgelly Iron and Coal Co. (Limited).	Daniel Hunter -	Ditto -		At face. Long wall - - -	–	1	–	–	–
„ 9	16	Ditto -	Ditto -	Ditto - -	David Westwater -	Ditto -	51	On incline, at junction of his road. Long wall.	–	1	–	–	–
Oct. 2	17	Stevenston -	Bothwell, Lanark	Lesmahagow & Longlee Coal Co.	David Anderson -	Ditto -	20	At "stooping," while holing - -	–	1	–	–	–

List of the Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost. Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
Oct. 7	18	Haughhead -	Hamilton, Lanark	John Macdonald -	Charles Hawkins	Collier -	35	At "stooping," while pinching off a piece of coal.	–	1	–	–	–
„ 11	19	Lassodie -	Beath, Fife -	Lassodie Coal Co. -	Robert Bower -	Brusher -	32	At face of brushing - - -	–	1	–	–	–
„ 12	20	Greenhead -	Cam'nethan, Lanark.	Coltness Iron Co. -	William Brown -	Collier -	39	At "stooping," while drawing props from a stoop which was worked away.	–	1	–	–	–
Nov. 6	21	Over Dalserf -	Dalserf, Lanark	Wm. Barr & Sons -	John Dollan -	Ditto -	40	At "stooping," while drawing props from a "lift" which was worked off.	–	2	–	–	–
					James Currie -	Ditto -	21						
„ 19	22	Kelty - -	Beath, Fife -	The Fife Coal Co. (Limited).	Eben. Forrester -	Brusher -	39	On incline, while re-brushing it. Long wall.	–	1	–	–	–
Dec. 24	23	Drumshangie -	New Monkland, Lanark.	Drumshangie Coal Co. -	Robt. Swann -	Collier -	27	At face. Long wall - - -	–	1	–	–	–
								Total by falls of roof	–	24	–	–	–

IN SHAFTS.

Overwinding.

Mar. 5	1	Blantyre -	Blantyre, Lanark	Wm. Dixon (Limited) -	Pat. Houghnie -	Collier -	36	- - - - -	–	–	6	–	–
					Martin Houghnie -	Ditto -	16						
					Pat. Hopkins -	Ditto -	20						
					Thos. Murdoch -	Ditto -	50						
					Robt. Murdoch -	Ditto -	20						
					Mich. Currie -	Ditto -	40						

Ropes and Chains breaking—None.

Whilst ascending or descending by Machinery.

Oct. 5	2	Auchlochan -	Lesmahagow, Lanark.	Colin Dunlop & Co. -	William Brown -	Coupler -	13	Fell out of the cage while ascending shaft	–	–	1	–	–

List of the Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
						Falling into Shaft from Surface.							
Dec. 18	3	Cleland -	Bothwell, Lanark	William Dixon (Limited)	John Boyle -	Labourer -	50	Fell down shaft with a loaded hutch. He had opened the gate, but failed to see that the cage was not there.	–	–	1	–	–
						Things falling from Surface.							
Dec. 2	4	Haughhead -	Hamilton, Lanark	John Macdonald -	John McIvor -	Blacksmith	57	Struck by a stone or coal while stepping on to the cage. Died 13th December	–	–	1	–	–
						Falling from part way down.							
Apr. 12	5	Netherjohnstone	Dalzell, Lanark -	Glasgow Iron Co. -	Thos. McConnuskie	Roadsman -	30	Fell down a "blind" pit while he and others were lifting water from it with windlass and kettles.	–	–	1	–	–
						Things falling from part way down.							
Apr. 25	6	Craigneuk -	Dalzell, Lanark -	Merry and Cuninghame -	Henry Harris -	Sinker -	40	Struck by a piece of wood which formed part of, and fell from, a movable scaffold at splint coal.	–	–	1	–	–
June 3	7	Leven -	Wemyss, Fife -	The Fife Coal Co. (Limited)	John Johnstone -	Sinker -		Knocked off the scaffold by bucket door falling while fixing it. Sinking pit.	–	–	1	–	–
July 2	8	Dalzell -	Dalzell, Lanark -	John McAndrew & Co. -	George Smith -	Bottomer -	45	Struck by a piece of coal from ascending cage.	–	–	1	–	–

List of the Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost. Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
						Miscellaneous in Shafts.							
Mar. 4	9	Whiterigg -	New Monkland, Lanark.	Wm. Black & Sons -	Henry Parks -	Sinker -		By scaffold giving way while putting in "barring."	–	–	1	–	–
„ 19	10	Dykehead -	Hamilton, Lanark	Summerlee Iron Co. -	John Chapel -	Collier -	24	Crushed by descending cage while attempting to cross the bottom. There was a road by the side.	–	–	1	–	–
May 6	11	Bellsdyke -	New Monkland, Lanark.	Bellsdyke Coal Co. -	John McWilliams -	Bottomer -	68	Crushed by cage. Mistake of signals -	–	–	1	–	–
Dec. 26	12	Lodge -	Slamannan, Stirling.	John Watson - -	Jas. Anderson -	Collier -	45	Crushed by cage. He recklessly attempted to pass with a hutch across the cage after the signal had been made to lift it.	–	–	1	–	–
								Total in shafts - - -	–	–	17	–	–

MISCELLANEOUS UNDERGROUND.

Explosions of Gunpowder, &c.—None.

Suffocation by Gases—None.

Irruptions of Water—None.

Falling into Water.—None.

List of the Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
					On Inclined Planes.								
Aug. 30	1	Greenfield -	Hamilton, Lanark	Hamilton Coal Co. -	John Greenhorn -	Bogie-rider	18	Fell off bogie and was run over by tubs -	–	–	–	1	–
					By Tubs and Trams.								
Apr. 20	2	Cadzow -	Hamilton, Lanark	Cadzow Coal Co. (Limited)	Thos. Gilmour -	Drawer -	20	Crushed between loaded tubs and centre props on a double road while "snibbling" the tubs.	–	–	–	1	–
					By Machinery Underground—None.								
					Sundries Underground.								
Mar. 30	3	Niddrie -	Liberton, Edin. -	Benhar Coal Co. (Limited)	William Currie -	Stone-miner	35	Struck by stones from a shot which exploded while he was stemming it.	–	–	–	1	–
June 3	4	Fence -	Lesmahagow, Lanark.	Nitshill & Lesmahagow Coal Co.	Hector Coulter -	Brusher -		While unramming a shot which had missed fire it exploded.	–	–	–	1	–
Oct. 14	5	Hattonrigg -	Bothwell, Lanark	Mossend Iron Co. -	William Sneddon -	Stone-miner		Men were working at both sides of a fault, and had all but effected a communication. A shot from the opposite side blew through, and the stones struck him.	–	–	–	1	–
Nov. 13	6	Niddrie -	Liberton, Edin. -	Benhar Coal Co. (Limited)	James Brown -	Collier -	35	Buried in old waste. The seam lies at an angle of 80°. He had holed into an old working, and while stepping on some loose rubbish in it, it slipped away with him.	–	–	–	1	–
								Total, Miscellaneous Underground -	–	–	–	6	–

List of the Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
ON SURFACE.													
By Machinery on Surface.													
June 19	1	Garrion Gill -	Cam'nethan, Lan.	Coltness Iron Co. -	Thos. McQueen -	Surfaceman	63	Crushed by a pulley which he was oiling while in motion.	–	–	–	–	1
***Boilers bursting*—None.**													
Miscellaneous on Surface.													
Jan. 14	2	Cowdenbeath -	Beath, Fife -	Cowdenbeath Coal Co. -	Alex. Black -	Truck greaser	75	Run over by wagons - - -	–	–	–	–	1
Feb. 21	3	Southfield -	Lesmahagow, Lanark.	Nitshill and Lesmahagow Coal Co.	Gavin Hamilton -	Wagoner -		Squeezed between a wagon and pit-bank wall.	–	–	–	–	1
Mar. 5	4	Bathville -	Bathgate, Linlithgow.	James Wood - -	John Brown -	Joiner -	73	Crushed between two wagons while attempting to cross the line.	–	–	–	–	1
June 25	5	Garrion Gill -	Cam'nethan, Lan.	Coltness Iron Co. -	Hugh Aird -	Pit-headman	33	Crushed between two wagons while shifting them at the screens. Died 9th Oct.	–	–	–	–	1
Aug. 19	6	East Benhar -	Whitburn, Linlithgow.	Benhar Coal Co. (Limited)	Margaret Gray -	Pit-head runner.	18	Crushed by cage. She was examining the struts, unknown to the engineman, when the cage came down upon her head.	–	–	–	–	1
Dec. 31	7	Balquhatstone -	Slamannan Stirling	John Watson - -	William Renton -	Screenman -	19	Crushed between wagons at the screens	–	–	–	–	1
								Total on Surface -	–	–	–	–	7
	58							Total in Coal Mines (65) -	2	33	17	6	7

List of the Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost: Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
					In Ironstone Mines.								
May 10	1	Salsburgh -	Shotts, Lanark -	Coltness Iron Co. -	John McMeekin -	Miner -	43	Fall of roof (sandstone) at face. Long wall.	–	1	–	–	–
July 9	2	Bankend -	Lesmahagow, do.	Monkland Iron and Coal Co. (Limited).	Andrew Carruthers John Carruthers -	Sinker - Ditto -	21 17	Suffocated by choke damp. They were sinking a windlass pit, which had only reached 40 feet from the surface. One fell when he reached the bottom; the other fell while endeavouring to rescue him. A few buckets of water dispelled the gas.	–	–	–	2	–
Aug. 26	3	Stepends -	Shotts, do. -	Summerlee Iron Co. -	John Quails -	Ditto -	33	Struck by a plank falling down shaft in a sinking pit.	–	–	1	–	–
Nov. 27	4	Penicuik -	Penicuik, Edin. -	Shotts Iron Co. - -	James Fairgrieve -	Miner -		Fall of ironstone at face. Long wall.	–	1	–	–	–
Dec. 9	5	Dunsyston -	Shotts, Lanark -	Summerlee Iron Co. -	James Nelson -	Ditto -	46	Struck by a splinter of ironstone flying off face.	–	1	–	–	–
								Total in Ironstone Mines - (6) -	–	3	1	2	–
Total	63							Total in Mines classed under the Coal Mines Regulation Act - (71) -	2	36	18	8	7

In Fire-clay Mines—None.

In Shale Mines—None.

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878.

L. Long wall. S. Stoop and room.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet						
Adams, Ord	Hill of Beath	Beath	Fife	D. Adams	Engine	14 ft., 15 ft. 5′ 6″, Dunfermline Splint, 4′ 6″.	L.	32	208	12×6	780	6×5	249	1	5,800	20	20,800	Fan.	N.F.	Fan 20′×5′.		
						Lochgelly do. 6′	Do.															
					West pit	Fire-clay	Do.	–	–	9×4	90	5×4	90	–	—	—	—	—	—			
Addie, Gavin, & Son.	Braidhurst	Dalziel	Lanark	T. S. Sneddon	No. 1	Main, 3′ 6″, and	S., and	–	–	—	—	17×5½	548	–	—	36	45,000	Fan.	F.	Fan 16′×6′.		
					No. 2	Pyotshaw, 3′ 10″.	S. & L.	11	52	17×6	588	—	—	2	1,330	36						
Addie, Robert, & Sons.	Rosehall	Bothwell	Do.	John Smith	No. 7	Splint, 3′ 6″	L.	12	107	14×5	810	12×5	444	4	4,322	25	27,300	Fan.	F.	"Schiele" Fan. 5 dia.	–	1
						Main, 3′ 9″	Do.															
						Pyotshaw, 4′ 9″	Do.															
					No. 13	Do.	Do.	11	102	14×5	690	12×5	444	3	1,160	25	14,100	Fan.	F.			
Do.	Benhar West	Shotts	Do.	James Gray	No. 2	Main Coal, 4′	Do.	7	28	16×6	660	—	—	1	1,452	30	10,800	Fur.	N.F.	Ironstone Pit is the upcast.		
Do.	Greenrigg	Falkirk	Stirling	Robt. Allen	-	-	-	1	10	10×5	48	6×5	48	1	60	24	2,000	—	N.F.			
Do.	Craigburn	Do.	Do.	Do.	No. 3	2 feet coal	Do.	–	–	5×5	54	5×5	54	–	—	—	—	—	—			
Alloa Coal Co	Alloa	Alloa	Clackmannan	And. Hunter	Garnstar	Splint and Cherry	Do.	16	101	13×5	190	13×5	195	4	1,225	24	18,200	Fur.	N.F.		–	1
					Brandy Hill, No. 2.	-	Do.	–	–	—	—	—	—	–	—	—	—	—	—			
					Whinhill	Cherry	Do.	10	56	10×5½	168	5×5½	168	2	900	27	15,750	Fur.	N.F.			
					Broom	-	Do.	–	–	—	—	—	—	–	—	—	—	—	—			
					Old Mains	-	Do.	–	–	10×9	438	—	—	–	—	—	—	—	—			
					Holton, No. 2	Cherry and Splint	Do.	19	105	10×5½	360	10×10	450	2	1,700	22½	15,500	Fur.	N.F.			
					Sprotwell	Upper, 5 feet	Do.	–	–	5×4½	222	5×3	150	–	—	—	—	—	—			
					No. 1 Holton	Nine feet	Do.	10	29	13×10½	318	5×7½	284	1	2,000	25	9,900	Fur.	N.F.			
Do.	Sheardale	Dollar	Do.	Do.	Sheardale	Cherry, Splint	Do.	–	–	13×5	168	8×8	60	–	—	—	—	—	—	Stopped 1878.		
					No. 1 Mine	Cherry	Do.	–	–	7×6	—	9×4½	126	–	—	—	—	—	—			
Do.	Tillicoultry	Clackmannan	Do.	Do.	No. 1 Mine	Cherry	Do.	–	–	7×6	—	7×5	42	–	—	—	—	—	—			
					No. 2 Drummie	Do.	Do.	12	88	7×5½	—	13×5	90	2	1,540	24	16,700	Fur.	N.F.			
												9×4½	126									
Clackmannan Coal Co.	Clackmannan	Do.	Do.	Henry Terris	No. 14	Splint, 3′ 4″, and	Do.	8	28	14×5½	258	12×5½	180	4	920	16	16,940	Fur.	N.F.	-	–	2
					No. 15	Cherry	Do.	9	50	—	258	—	180	2	960	17	11,030	Fur.	N.F.			
					No. 5 Southfield	Do. do.	Do.	6	19	14×6	360	10×5	114	2	1,700	18	9,790	Fur.	N.F.			
Do.	Kennetpans	Clackmannan	Do.	Do.	No. 1	Cherry	Do.	9	43	12×5	360	11×5	156	2	1,890	16	10,200	Fur.	N.F.			
Do.	Ferryton	Do.	Do.	Do.	No. 1	Cherry and Splint	Do.	14	70	14×6	348	12×6	250	4	980	19	20,600	Fur.	N.F.			
					No. 2	Do. do.	Do.	9	52	12×6	348	12×6	250	2	950	18	14,000	—	N.F.			
Ander on, G.	Crosshill	Slamannan	Stirling	G. Anderson	No. 1	Coxrod	L.	–	–	8×5	84	—	—	–	—	—	—	—	—	Just s nk.		
Austine & Co.	Allanton	Hamilton	Lanark	Malc. McFarlane	No. 1	Ell Coal, 5 6″	S.	29	127	16×6	385	3½×6	385	2	4,800	55	38,000	Fan.	F.	Guiba 130′×10′	1	1
					No. 2	Main, 4′ 4″	Do.	–	–	12×6	494	4×6	494	1	3,430	36	7,000	—	F.			
					No. 2	Splint, 5′	Do.	2	11	—	554	—	554	2	7,320	42	26,000	—	F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Arniston Coal Co. (Limited)	Arniston	Cranston	Edinburgh	James Clark	Emily	Parrot Splint, 4′ Great Kailblades	L. & S.	27	198	15×9	960	8	480	5	1,220	37	31,700	Fan.	N.F.	Fan 25′ dia.	–	1
					Engine	Kailblades, Wee Splint.	Do.	3	30	9	600	—	—	1	1,300	36	18,700	—	N.F.			
					Camp	Parrot	Do.	–	–	7×5	156	5×4	156	–	—	—	—	—	—			
					Common	Do.	Do.	7	47	7×5	420	5×4½	420	1	960	25	6,075	Fur.	N.F.			
					Gore	Splint, Kilblades	Do.	5	22	10×10½	648	8×10½	648	1	1,166	30	10,500	Fan.	N.F.			
Avonhead Coal Co.	Avonhead	New Monkland	Lanark	Jas. Hogg	No. 1	Virtuewell, 2′	L.	–	–	12×5	132	6×5	136	–	—	—	—	—	—	–	–	1
						Musselband	Do.	–	–	—	196	—	196	–	—	—	—	—	—			
					No. 5	Virtuewell	Do.	8	40	12×5	48	12×5	60	2	456	12	2,620	Fur.	N.F.			
						Lady Grange	Do.	–	8	6×5	97	6×5	49	1	240	16	630	Fur.	N.F.			
Alexander, C. J.	Jaweraig	Slamannan	Stirling	John Adam	No. 12	Coxrod	Do.	2	16	12×5	72	—	82	1	120	24	2,300	Fur.	N.F.			
					No. 13	Do.	Do.	–	–	—	—	10×5	66	–	—	—	—	—	—			
					No. 14	Do., 2′ 8″	Do.	2	20	6½×5	42	4½×5	56	1	120	20	1,200	Fur.	N.F.			
Allanshaw Coal Co.	Allanshaw	Hamilton	Lanark	Jas. J. Forgie	No. 1	Ell, 7′ 3″	S.	31	140	13½	696	—	—	3	2,865	48	40,000	Fan.	F.	Fan 20′ dia.		
					No. 2	–	–	—	–	—	—	13½	696	–	—	—	—	—	—			
Baird, W., & Co.	Bothwell Park	Bothwell	Do.	J. Paterson	No. 1	Splint, 3′ 6″	Do.	16	100	21×5½	1,074	—	—	–	—	40	—	—	F.	–	–	1
					No. 2	Do.	Do.	17	133	—	—	20×5½	1,050	3	1,200	50	65,000	Fan.	F.	Fan. 25′×8′.		
Do.	Craighead	Blantyre	Do.	Do.	No. 1	–	–	9	5	23×7	856	—	—	–	—	—	—	—	F.	–	–	2
					No. 2	Ell, 5′	Do.	12	55	—	—	23×7	852	2	560	78	39,000	Fan.	F.	Fan. 20′×6′.		
Do.	Bothwell Castle	Bothwell	Do.	Do.	No. 1	–	–	14	36	—	—	—	—	–	—	—	—	—	—	Sinking.		
					No. 2	–	–	–	–	—	—	—	—	–	—	—	—	—	—	Ditto.		
Balfour, Chas. B.	Balgonie	Markinch	Fife	Geo. Linton	Lochtyside	Nine feet	Do.	17	53	10×5	396	6×5	72	2	1,400	20	8,500	Fur.	N.F.			
Balfour, John	Balbirnie	Do.	Do.	Jno. Oswald	Quarry	Little Coal	Do.	3	27	7×4½	60	7×4½	120	1	850	24	1,350	Fur.	N.F.			
					Pitcairn	Do.	Do.	–	–	5	54	5½	60	–	—	—	—	—	—			
					Newton	Main Coal, 4′ 6″	S.	5	17	5½	120	5×7	60	1	1,400	24	1,500	Fur.	N.F.			
Barr, Wm., & Sons	Over Dalserf	Dalserf	Lanark	Wm. Barr	No. 1	Main, 4, Splint, 4′ 3″	Do.	4	24	4×5½	72	3½×5	72	1	360	32	12,000	Fur.	N.F.	–	–	–
					No. 2	Main	Do.	3	16	9×5	168	12×5	168	1	1,300	32	13,000	& S.	N.F.			
					No. 3	Ell	Do.	6	39	5½×4	156	—	78	1	200	45	—	jet.	N.F.			
						Main	Do.	–	–	—	240	5½×4	168	1	1,300	32	—	—	—			
Do.	Longlee	Do.	Do.	Jas. Malcolm	No. 1	Ell Coal, 6′	S.	12	5	14×5½	162	—	—	2	500	18	16,400	—	N.F.	–	–	1
					No. 2	Splint, 5′ 1″	Do.	—	—	9¾×6	426	6×4¾	426	–	—	—	—	—	—			
					No. 2	Main, 4′ 10″	Do.	—	42	9¾×6	328	6×4¾	328	2	1,000	36	12,794	Fur.	N.F.			
Barr, Thomas	Orchard	Carluke	Do.	Jno. McCulloch	No. 1	Gas Coal, 2′	L.	18	138	4×5	—	14×5	120	2	2,870	16	8,990	Fur.	F.	–	–	1
Barr and Higgins	Langbyres	Shotts	Do.	Thos. Lithgow	No. 2	Virtuewell	Do.	3	41	14×5½	180	15×5½	270	2	565	16	5,660	Fur.	F.	–	1	–
					Nos. 3 and 4	Virtuewell	Do.	–	–	12×5	60	9×5	48	–	—	—	—	—	—			
Do.	Westwood	Do.	Do.	Do.	No. 1	Virtuewell	Do.	9	61	12×5	126	12×5	528	3	1,070	16	13,820	Fur.	F.			
Barrowman, Thos.	Canderside	Dalserf	Do.	Thos. Barrowman.	No. 1	Virtuewell	Do.	4	26	3½×3¼	Mine	10×5½	66	1	800	14	3,000	Fur.	N.F.			
Barrowman, Jas.	Prestonhall	Cranston	Edinburgh	–	No. 1	Splint	L.	4	7	7×4	84	3¾×4	84	1	60	20	400	Nat.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Bellsdyke Coal Co.	Bellsdyke	New Monkland	Lanark	And. Pettigrew	No. 1	Kiltongue, 3′	L.	2	12	11×5	180	6×5	228	1	1,420	16	1,320	Fur.	F.		1	2
					No. 1	Drumgray, 2′	Do.	2	32	11×5	228	6×5	228	1	400	20	2,000	Fur.	F.			
					No. 2	Do.	Do.	1	5	11×5	270	—	—	1	500	14	2,200	Fur.	F.			
					No. 2	Kiltongue	Do.	2	19	11×5	240	—	—	1	600	16	2,000	Fur.	F.			
					No. 3	Virtuewell	Do.	—	—	5×7	438	5×5½	312	—	—	—	—	—	—	Not working.		
					No. 3	Kiltongue, 4′	Do.	8	32	5×7	444	4×5	444	1	700	32	4,480	Fur.	F.			
					No. 5	Main	Do.	5	37	7×5	198	4×5	198	1	760	24	22,000	Fan	F.	Fan 16′ dia.		
					No. 4	Kiltongue	Do.	6	25	17×6	576	4×6	576	2	160	15	8,700	—	F.	Fan 10′ dia.		
Benhar Coal Co. (Limited).	Benhar (West)	Shotts	Do.	James Wyper	Hartwoodhill, No. 2.	Virtuewell	Do.	5	22	—	—	13×5	228	1	970	17	9,600	Fur.	N.F.		—	4
					No. 3	—	—	—	—	8×4	78	—	—	—	—	—	—	—	—			
					Baton	Virtuewell, 3′	Do.	—	—	12×5	54	5×4½	54	—	—	—	—	—	—			
					No. 6 Pit	Do.	Do.	8	83	14×6	180	12½×5	126	1	1,800	20	10,000	Fan	N.F.			
					No. 10 Pit	Do. 3′ 10″	Do.	6	30	13×5	150	—	—	1	2,000	30	9,600	—	N.F.			
					No. 15	Ball Coal	Do.	5	44	—	—	8×5	180	1	1,000	25	12,000	Fur.	N.F.			
					Blairmuckhill	Do.	Do.	—	—	15½×5	126	6×5½	126	—	—	—	—	—	—			
					No. 17	Virtuewell	Do.	7	55	13×5	96	—	72	1	600	24	11,000	Fur.	N.F.			
					No. 9	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Do.	Do. (East)	Whitburn	Linlithgow	Thos. Gillies	Starryshaw	Do. 4′ 2″	Do.	9	74	10½×5½	304	14×5	198	2	1,700	24	16,000	Fan	N.F.		1	3
					No. 6	Virtuewell, 4′	Do.	—	—	—	—	12×5	186	—	—	—	—	Fan	—			
					No. 10	Ball Coal, 2′ 4″	Do.	9	100	—	—	12×5	342	3	1,830	24	21,600	Fur.	N.F.			
					No. 13	Do.	Do.	6	50	10×5	324	—	—	—	—	—	—	—	N.F.			
					No. 15	Do.	Do.	—	—	22×6	360	—	—	—	—	—	—	—	N.F.			
Do.	Niddrie	Liberton	Edinburgh	Alex. McCallum	No. 1	South Parrot	—	—	—	11×5	564	9×9	84	—	—	—	—	—	—	"Edge coals."	2	3
					No. 2	North Greens	—	—	—	11×5	642	9	100	—	—	—	—	—	—			
					No. 3	—	—	—	—	7	300	5×6	300	—	—	—	—	—	—			
					No. 7	Great, Stairhead	S.	19	185	16×5	1,440	9×4½	120	4	1,530	18	27,860	Fan.	N.F.	Fan 18′×7′.		
					No. 8	5′ 10″ — 4′ 9′	—	—	—	—	—	—	—	—	—	—	—	—	—			
					No. 10	Great, Stairhead	S.	13	72	16×6	1,290	5×4	156	2	730	16	11,000	Fan	N.F.	12′×7′.		
					No. 11	Do.	Do.	11	78	17×6	720	7×6	300	2	690	18	22,900	Fan	N.F.	18′×6′.		
					No. 5	—	—	—	—	11×6	348	5×6	348	—	—	—	—	—	—	Sinking.		
					No. 6	—	—	—	—	11×5	630	4×4	630	—	—	—	—	—	—	Do.		
Black, Wm., & Sons	Arden	New Monkland	Lanark	Jas. Prentice	No. 1	Virtuewell and Upper Drumgray.	—	—	—	7½×5	280	5½×5	300	—	—	—	—	—	—	—	—	1
					No. 1																	
					No. 2	Virtuewell	L.	—	—	7½×5	132	5½×5	142	—	—	—	—	—	—			
					No. 3	Splint, 4′ 6″	S.	—	—	13×5	66	8×5	78	—	—	—	—	—	—			
					No. 4	Virtuewell	L.	6	64	7½×5	162	6×5	182	3	610	25	7,010	Fur.	F.			
					No. 6	Do. 2′ 1″	Do.	2	21	7×5	84	5×5	90	2	310	25	4,100	Fur.	F.			
Do.	Brownyside	Do.	Do.	Do.	No. 1	Lower Drumgray, 2′ 4″	Do.	16	152	14×5	300	—	—	—	—	—	—	—	—			
					No. 2	—	Do.			—	—	12×5	315	6	990	25	31,500	Fan	F.	Fan 20′ dia.	—	1
Do.	Meadowfield	Do.	Do.	Do.	No. 3	Splint, 3′ 6″	Do.	5	25	12×5	60	—	—	—	—	—	—	—	—			
					No. 4	—	Do.	—	—	7×5	66	5½×5	74	2	400	21	3,800	Fur.	N.F.			
Do.	Whiterigg	Do.	Do.	Do.	No. 1	Kiltongue, 2′ 6″	Do.	11	30	12×5	180	—	—	—	—	—	—	—	—			
					No. 2	Do.	Do.	—	—	—	—	8×5	144	2	240	24	7,700	Fur.	N.F.		1	1
Do.	Southfield	Slamannan	Stirling	John Errington	No. 1	Coxrod and Splint	Do.	34	120	7×5	342	6×5	360	4	1,050	20	12,325	Fur.	N.F.			
					No. 2	Coxrod	Do.	3	28	12×5	240	—	—	1	930	20	4,600	—	N.F.			
					No. 3	Do. and Splint	Do.	6	42	8×5	210	5×5	225	3	510	21	11,200	Fur.	N.F.			
					No. 4	and Lady Grange	Do.	—	—	12×5	90	—	—	—	—	—	—	—	—			
Blindburn Coal Co.	Blindburn	Cam'nethan	Lanark	W. Darling	No. 1	Shotts Gas	Do.	2	6	6×5	66	5×4½	66	1	120	16	1,900	Fur.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.									
															yards.	feet.						
Bowman & Co.	Cameron	Markinch	Fife	Arch. Bowman	No. 1 No. 2	Dysart Main 6′	L.	9	55	10×5	114	13×5	192	2	1,740	25	10,000	Fur.	N.F.			
Do.	Muiredge	Wemyss	Do.	Do.	No. 1 No. 2	Chemiss, 9′ 8″ 6 feet. 8 feet	Do. Do. & S.	39 —	142 —	15×6 —	480 —	10×5 —	438 —	3 —	1,342 —	20 —	15,090 —	Fur. —	N.F. —	- - -	1	—
Boxton Coal Co.	Boxton	Slamannan	Stirling	G. B. Watson	No. 1	Soft Coal	L.	5	17	6×4	76	10×5	76	1	—	12	4,500	Fur.	N.F.			
Brand & Co.	Overtown Station	Cam'nethan	Lanark	Thos. Gardiner	No. 1 No. 2	Ell, 9′, Main, 4′ 6″ Do., 9′	S Do.	14 5	64 73	14×5 —	282 69	5×5 —	252 79	2 1	169 80	42 60	13,200 6,000	Fur. Fur.	F. N.F.			
Broomfield Coal Co.	Broomfield	New Monkland	Do.	Robt. Muir	No. 1	Virtuewell, 2′ 6″ Kiltongue, Drumgray.	L. Do.	5	30	9×5	360	5 4½	360	2	700	18	8,000	Fur.	F.	- - -	—	2
Brown, Thomas	Largoward and Lathallan	Kilconquhar	Fife	Thos. Ireland	No. 1 No. 2	Splint	Do.	17	80	14×5	384	9×5	300	1	2,716	12	11,000	Fur.	N.F.	- - -	1	—
Do.	Falfield	Do.	Do.	Do.	No. 1	Ell, Splint, and Cannel.	Do.	9	37	16×5½	276	—	—	1	260	12	5,100	Fur.	N.F.			
Blairingone Coal Co.	Blairingone	Fossoway	Perth	Robt. Martin	No. 1	Coalsnaughton-main, 6′.	S.	3	18	6×5½	168	5½×4	168	2	1,000	24	8,000	Fur.	N.F.			
Brownrigg Coal Co.	Brownrigg	New Monkland	Lanark	Jno. Park	No. 1 No. 2	Drumgray Do.	L. Do.	6 1	50 —	8×5 6×5	90 144	5×5 5×5	100 154	2 —	1,000 —	18 —	3,300 —	Fur. —	N.F. —			
Bent Colliery Co., (Limited).	Bent	Hamilton	Do.	A. Blythe	No. 1 No. 2	Ell, 7′ 6″ —	S. —	39 —	176 —	13½×6 —	636 —	14×6 —	636 —	4 —	1,950 —	50 —	64,477 —	Fan —	F. —	Fan 25′×8′	1	3
Broxburn Oil Co. (Limited).	Broxburn	Uphall	Linlithgow	Alex. Kennedy	Newbigging No. 4 No. 5	Hurlet Coal, 3′ 8″ — —	S. Do. Do.	— — —	— — —	10×6 6×6 8×6	Mine Mine 516	7×7 12×6 6×6	90 144 516	— — —	— — —	— — —	— — —	— — —	— — —	Standing.		
Cadzow Coal Co. (Limited).	Cadzow	Hamilton	Lanark	H. Smith	No. 1 No. 2 No. 3	Main, 4′ 3″ Ell, 7′ 4″ Splint	Do. Do. —	7 34 —	14 200 —	24½×7 21¼×6 —	804 737 —	— — 13½	— — 888	1 3 —	330 3,100 —	42 55 —	13,000 54,000 —	— — Fan.	F. F. F.	- - - Guibal, 40′×12′.	1	5
Cadell, James, and Co.	Redford	Muiravonside	Linlithgow	Jas. Cadell	Broadhead	Main Coal	L. & S.	4	23	12½×5½	205	10×5	120	1	680	24	5,326	Fur.	F.	Fur. on surface.		
Cadell, Henry	Grange	Carriden	Do.	Do.	Acre and Level No. 4 Mines Nos. 3 and 5	Parrot, 6′ Do. Splint, Parrot	Do. Do. Do.	18 11 17	34 24 52	6×6 7×6 8 & 9	660 900 220	9 9 8	150 130 120	1 2 2	1,870 1,100 3,470	25 22½ 30	8,310 6,650 16,400	Fur. Fur. Fur.	F. F. F.	Mine dipping 1 in 4½. Do. 1 in 7.		
Callendar Coal Co.	Callendar	Falkirk	Stirling	Peter McBeth	No. 4 No. 6 No. 7 No. 8	Coxrod and Splint Do. Do. Do.	Do. Do. Do. Do.	66	244	7×5 — 12×5 7×5 12×5	84 84 96 96 96	12×5 12×5 7×4½ 12×5	192 252 84 57 84	1 2 2 2 2	380 260 560 160 450	12 12 14 12 14	4,320 3,380 6,200 5,390 6,200	Fur. Fur. Fur. Fur. Fur.	N.F. N.F. N.F. N.F. N.F.	- - -	—	1
Carron Co.	Carron Hall	Larbert	Do.	Jas. Clelland	Burn William No. 5	Coxrod Do. and Main Main	Do. Do. Do.	9 17 11	55 64 64	13×5 9×7 11	141 291 240	14×5 14×7 11	282 291 381	1 2 1	1,480 1,480 2,090	9 16 30	2,190 13,300 4,770	Fur. Fur. Fur.	N.F. N.F. N.F.	Fur. on surface. - - -	—	1
Do	Kinnaird	Do.	Do.	Do.	No. 6	Crow	Do.	7	21	8	78	9	78	1	966	27	3,780	Fur.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated. Parish.	Where situated. County.	Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed. Above Ground.	No. of Persons employed. Below Ground.	Size and Depth of Downcast and Upcast Shafts. Downcast. Size in Feet.	Downcast. Depth in Feet.	Upcast. Size in Feet.	Upcast. Depth in Feet.	Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
															yards.	feet.						
Carron Co. -	Shieldhill -	Falkirk - -	Stirling -	Robt. Clelland -	No. 6 - -	Coxrod - -	L. -	7	47	10	216	10	216	1	870	24	4,250	Fur.	N.F.			
Do. - -	Blairhall - -	Culross - -	Perth - -	Alex. Clelland -	No. 3 - -	- - -	S. -	4	20	15×5	522	8×6	498	1	550	40	2,000	Fur.	N.F.	No. 2, Blairhall upcast.		
Christie, Robt. -	Kilmux - -	Kennoway - -	Fife - -	Robt. Forrester	No. 1 - -	Six feet - -	L -	6	17	13½×4½	420	9×4½	342	3	1,440	16	6,000	Fur.	N.F.			
					No. 3 - -	- - -	- -	—	—	—	—	—	—	—	—	—	—	—	—	No. 3 stopped.		
Christie, John -	Milnwood - -	Bothwell - -	Lanark - -	W. Easton -	No. 4 - -	Pyotshaw - -	L. -	3	9	8½×5	362	16×5	430	1	968	6	3,200	Fur.	F.			
Clerk Sir G., Bart.	Brunstane - -	Pennicuik - -	Edinburgh -	Alex. Coutts -	- - -	North Coal -	Do. -	3	8	9×5	210	5×4	90	-	300	35	—	Fur.	N.F.			
Clyde Coal Co. (Limited).	Backmuir - -	Hamilton - -	Lanark - -	Robt. Beith -	No. 1 - -	Ell Coal, 7′ 4″ -	S. -	23	125	24×7	660	—	—	4	1,680	63	41,864	—	F.	- - -	1	2
					No. 2 - -	Main - -	Do. -	3	14	16×7	750	8×7	750	2	450	50	10,098	Fan.	F.	Fan 20′×5′.		
Do. -	Town Lands -	Do. -	Do. -	Do. -	No. 1 - -	Ell - - -	Do. -	17	105	7×8	702	16×7	702	3	1,800	70	30,072	Fan.	F.	Fan 20′×5′.		
Cochrane, N., & Co.	Cornsilloch - -	Dalserf - -	Do. -	Abraham Thomson.	Millburn -	Main, 4′ - -	Do. -	8	70	13×5½	180	—	—	2	2,080	40	15,200	Fur.	F	- - -	1	—
					Cornsilloch -	Ell, 4′ 3″ - -	Do. -	7	48	8×5½	492	12×6	516	1	2,600	30	4,500	Fur.	F.			
					Skellyton -	Main, 4′ -	Do. -	—	—	13×5½	180	—	—	-	—	—	—	—	—			
					- - -	Do. - -	Do. -	—	—	—	—	10×5	78	-	—	—	—	Fur.	—			
Cochrane, A. L, and Bros.	Fountainhall -	Pencaitland -	Haddington -	Andrew Smith -	Nos. 3 & 4 -	Rough and Splint	L- -	3	25	10×5	58	6×5	68	1	580	18	5,300	Fur.	N.F.			
Cluny Coal Co. -	Cluny - -	Kirkcaldy - -	Fife - -	Arch. Bowman, jun.	No. 1 - -	Lochgelly splint -	Do. -	—	—	12×5½	312	—	—	-	—	—	—	—	—			
					No. 2 - -	- - -	Do. -	—	—	10×5	222	10×5	222	-	—	—	—	—	—			
Coltness Iron Co.	Garrion Gill -	Cambusnethan -	Lanark - -	Jno. Wardlaw -	No. 4 - -	Main - -	S. -	8	50	14×5½	172	8	210	2	1,508	48	19,100	Fan	F.	Fan 14′×6′ - -	3	7
					No. 5 - -	Main, 4′ 3″ - -	Do. -	8	50	13×5½	102	—	—	-	—	—	—	—	F.	"Guibal" 15′×5′.		
					- - -	Splint - -	Do. -	3	18	—	192	—	300	1	1,954	40	3,420	—	F.			
					No. 6 - -	Ell - -	Do. -	3	10	9×5½	144	5×5½	180	1	160	60	4,000	Fur.	F.			
					- - -	Main - -	Do. -	5	50	—	290	9	162	2	475	50	21,850	—	F.	Fan at No. 1.		
					- - -	Splint - -	Do. -	4	48	—	—	—	252	2	584	50	18,500	—	F.	Do.		
					No. 7 - -	Main, 5′ 6″ -	Do. -	1	10	9×5½	390	5½×5½	390	1	440	36	4,000	Fan.	F.	Fan 16′ ×6′.		
					- - -	Splint, 5′ 6″ -	Do. -	9	65	—	480	—	480	2	1,320	35	15,200	—	F.			
					No. 8 - -	Main - -	Do. -	2	12	15×6	120	9	162	1	497	48	5,300	—	F.			
					- - -	Splint, 5′ 6″ -	Do. -	7	48	—	120	—	252	1	1,630	48	15,120	—	F.			
					No. 9 - -	Main - -	Do. -	5	56	—	212	8×6	213	1	989	40	20,000	Fur.	F.			
					- - -	Splint - -	Do. -	5	48	—	312	—	313	1	1,132	50	18,000	—	F.			
Do. -	Coltness Iron Works.	Do. -	Do. -	W. W. Muir -	Greenhead, No. 3	Main - -	Do. -	2	24	13×5½	258	5½×3	294	1	1,500	40	3,700	Fur.	F.	- - -	1	3
					Do. Do.	Splint, 5′ - -	Do. -	3	29	—	369	—	405	1	1,716	50	3,700	Fur.	F.			
					Do. No. 5	Ell, 7′ 6″ -	Do. -	9	69	14×6	282	4×6	324	2	1,505	70	19,460	Fur.	F.			
					Do. No. 6	Main - -	Do. -	4	62	11×6	349	6×6	391	2	750	57	11,150	Fur.	F.			
					Do. Do.	Splint, 5′ 3″ -	Do. -	5	64	—	456	—	498	2	916	42	14,025	Fur.	F.			
					Crindledyke, No. 2.	Virtuewell -	L. -	8	58	14×5½	161	6×4	77	1	930	28	6,600	Fur.	F.	- - -	—	1
					Stonecraigs, No. 4.	Ell, 9′ 6″ - -	S. -	11	86	14×6	140	4×6	140	2	960	70	15,337	Fan.	N.F.	Fan 15′ dia. -	—	2
					- - -	Main, 4′ 9″ -	Do. -	3	21	—	140	—	140	1	900	42	2,700	—	N.F.			
					Royal George Mine	Ell - - -	Do. -	3	13	8×5	—	3½×3½	31	1	140	44	4,200	Fur.	N.F.			
						Main - -	Do. -	5	30	—	—	—	34	-	—	—	—	—	—			
					No. 3 - -	Splint, 5′ 6″ -	Do. -	—	—	—	—	—	—	-	—	—	—	—	—	Stopped Aug. 1878.		
					Victoria Mine	Splint - -	Do. -	2	6	9×5	—	5½×3½	29	-	—	—	—	—	—	Do. Mar. 1878.		
					Newmains do.	Do. - -	Do. -	2	16	9×6	—	—	—	-	—	—	—	—	—	Do. Nov. 1878.		
Do. -	Woodend - -	Torphichen -	Linlithgow -	Jno. Stevenson	No. 2. - -	Main - -	S. -	3	7	6	192	5	216	1	1,300	32	6,050	Fur.	N.F.			
					No. 5. - -	Do. - -	Do. -	10	53	—	—	—	—	-	—	48	—	—	—			
Coatbridge Tinplate Co. (Lim.)	Hill - - -	Muiravonside -	Stirling -	Robt. Baxter -	- - -	- - -	- -	—	—	—	—	—	—	-	—	—	—	—	—			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Cowdenbeath Coal Co.	Cowdenbeath	Beath	Fife	Wm. Moody	No. 2	Splint, 4′ 4″, 5 feet, 5′ 6″.	L.	20	83	14×5	480	—	—	1	1,780	36	—	—	N.F.			
					No. 3	Splint, Mynheer, 3′ 4″.	S.	40	176	—	—	14×5½	648	1	2,270	30	32,800	Fan.	N.F.	Fan 24′ × 8′	1	—
					No. 7	5 feet	L.	21	29	11×10	812	10×5	812	1	100	—	12,300	Fan.	N.F.	Fan 10′.		
					No. 8	Lochgelly splint, Parrot.	Do.	36	96	9×6	540	6×5	540	1	1,600 780	36 30	5,200 13,945	Fur. —	N.F. —			
Crofthead Coal Co.	Crofthead	Whitburn	Linlithgow	Jas. Williamson	No. 1	Lower Drumgray	L.	—	—	10×5	60	4×4	52	—	—	—	—	—	—	Stopped.		
					No. 2	Do.	Do.	—	—	4½×6½	240	10×6½	240	—	—	—	—	—	—			
					No. 3	Shott's Ball	Do.	—	—	4×4½	78	4×4½	78	—	—	—	—	—	—			
Craignethan Gas Coal Co.	Craignethan	Lesmahagow	Lanark	A. Thomson	Craignethan	Gas Coal, 20″	Do.	24	120	4×3	—	6½×2½	324	3	1,700	15	10,000	Fur.	N.F.	Downcast is a mine dipping 1 in 8.	—	1
Do.	Blair	—	Do.	Do.	Blair Mine	Do.	Do.	1	14	5×5	—	5×5	—	1	500	18	1,200	Fur.	N.F.			
Darling, Wm., (Trustees of).	Cleugh Gas Coal Works.	Carnwath	Do.	Wm. Hogg	No. 1	Do.	Do.	5	63	13×5	156	—	—	3	598	14	11,278	—	N.F.	No. 5 is the upcast.	—	1
					No. 4	—	—	—	—	12×5	84	—	—	—	—	—	—	—	—			
					No. 5	Do.	Do.	11	56	—	—	13½×5½	312	—	—	—	—	Fur.	N.F.	Air from Nos. 1 & 4.		
					No. 6	Do. 2′ 2″	Do.	8	16	18×5½	270	—	—	1	5,076	12	4,863	Fur.	N.F.	No. 8 is the upcast.		
					No. 6	Main Coal	Do.	8	—	18×5½	144	—	—	2	286	30	1,915	Fur.	N.F.	No. 7 ditto.		
					No. 7	—	Do.	—	—	—	—	11×5	162	—	—	—	—	—	—			
					No. 8	Gas Coal	—	—	—	—	—	12×5	87	1	220	15	4,060	Fur.	N.F.	Air from No. 6.		
Deans and Moore	Carberry	Inveresk	Edinburgh	Ralph Moore	No. 1	Great Seam, 9′	S.	16	108	14×5	420	12×5	420	1	2,500	60	30,000	Fan	N.F.	Waddle," 16′ dia.		
Do.	Penston	Gladsmuir	Haddington	Do.	No. 1 Sir Roger	Splint, 4′	L. Do.	13	102	15×5	162	15×5	150	1	2,000	20	15,000	Fur.	N.F.			
Do.	Elphinstone Tower.	Tranent	Do.	Jos. Moore	Billyford	Parrot, Splint, and 5′.	Do. S.	15	115	6×5½	Mine	15×5	120	—	540	20	12,000	Fur.	N.F.			
Do.	Pencaitland	Pencaitland	Do.	Do.	Valley	Splint	L.	22	59	16×5	132	12×5	130	1	2,000	20	13,000	Fur.	N.F.			
Denend Coal Co.	Denend	Auchterderran	Fife	David Thomson	No. 1	Splint 5′, Little 3½′, Duddie-Davie, 5′	Do.	17	88	14×6	432	—	—	5	1,360	16	8,400	Fur.	N.F.			
					No. 2	—	Do.	—	—	—	—	14×6	432	1	—	—	—	—	—			
Dick, James	Knownoble	Shotts	Lanark	James Dick	No. 1	Virgin and Virtuewell, 1′ 10″.	L.	4	19	6×4	336	6×4	336	1	300	16	3,880	Fur.	F.			
					No. 2	Ell, 5′ 6″, Main, 4′	S.	16	32	6×4	318	6×4	318	1	800	16	3,200	Fur.	F.			
Dick, Robert	Wyndedge	Bothwell	Do.	Robt. Dick	No. 1	Splint	L.	5	15	—	—	12×5½	168	1	640	16	3,100	Fur.	F.			
					No. 4	Virtuewell	Do.	4	13	5×5½	102	5×5½	102	1	560	16	2,500	Fur.	F.			
					No. 5	Splint	Do.	4	12	10×5½	168	—	—	—	—	—	—	—	F.			
Dixon, William, (Limited).	Fauldhouse	Whitburn	Linlithgow	Thos. Nimmo	No. 5	Big Coal	Do.	3	22	5×4	132	5×4	132	1	920	32	5,900	Fur.	N.F.			
					Nos. 7 and 11	Do.	Do.	5	18	18×6½	270	8×6½	210	1	1,800	48	3,060	Fur.	N.F.			
					No. 10	Shotts Ball	Do.	3	20	6×5½	270	6×5½	270	2	900	20	7,850	Fur.	N.F.			
					No. 1	Benhar	Do.	4	7	7×5½	42	5½×2	42	1	400	24	2,520	Fur.	N.F.			
Do.	Cleland	Bothwell	Lanark	Alex. Ferguson	No. 3	Virtuewell, 2′ 6″	Do.	10	69	9×6	540	9×6	540	2	630	25	20,000	Fan.	F.	Fan 17′×7′.	1	—
					No. 7	Ell, 7′	S.	4	24	11×5½	240	11×5½	240	1	730	40	9,953	—	F.			
					No. 7	Main and Pyotshaw	Do.	—	—	11×5½	258	9×6	240	1	666	25	—	—	F.			
					No. 7	Splint, 4′	L.	—	—	11×5½	330	11×5½	240	1	830	25	—	—	F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Dixon, William, (Limited.)	Carfin	Bothwell	Lanark	Alex. Ferguson	No. 1	Splint, 4′ 6″	L.	12	52	15×5½	480	—	—	2	1,825	20	11,374	—	F.	Fur. in No. 2 pit.		
					No. 2	Main, 4′	S.	7	40	—	—	10×5½	465	1	2,200	30	11,668	Fur.	F.			
					No. 3	Virtuewell, 2′ 8″	L.	8	41	15×5½	660	—	—	2	1,800	20	12,110	—	F.			
					Store Pit	Do.	Do.	7	38	—	—	15×5	546	—	—	20	—	Fur.	F.	Store pit aired from No. 3 Carfin.		
Do.	Blantyre	Blantyre	Do.	James Watson	Nos. 1 and 3	Ell, 7′	S.	33	238	24×8	702	—	—	2	3,866	36	31,500	Fur.	F.		7	6
					No. 1	Main, 4′ 2″	L.	—	—	24×8	680	—	—	—	—	—	—	—	—	Stopped.		
					No. 2	Splint, 7′ 6″	S.	13	122	16×8	780	—	—	2	1,976	45	52,945	Fur.	F.			
					No. 3	Do., 6′ 10″	Do.	29	195	24×8	930	—	—	2	3,483	45	31,824	Fur.	F.			
					No. 4	Do	Do.	20	106	16×8	804	8×8	804	4	1,156	38	34,000	Fans.	F.	Fans 14′ dia.		
					No. 5	—	—	—	—	—	—	10	810	—	—	—	—	—	—	Upcast.		
Do.	Wilsontown	Carnwath	Do.	J. Nimmo	No. 1	Main Coal	S.	10	58	8×5	132	7×4½	132	2	2,440	20	2,500	Fur.	N.F.			
					No. 2	Do.	Do.	—	—	—	130	—	130	—	—	—	—	—	—			
					No. 3	Do.	Do.	20	19	16×8	350	8×8	350	2	892	24	8,319	Fur.	N.F.			
Drumgray Coal Co.	Brownrigg	New Monkland	Do.	Jno. Murray	No. 3	Drumgray	L.	1	4	8×5½	72	5×5½	72	1	45	5	500	Nat.	N.F.		—	1
					No. 10	Virtuewell	Do.	3	43	8×5½	132	4½×5½	150	2	1,000	8	1,360	Fur.	N.F.			
Do.	Drumgray	Do.	Do.	Do.	No. 4	Drumgray	Do.	4	20	8×5½	264	4×5½	282	2	889	6	3,150	Fur.	N.F.			
Do.	East Greengairs	Do.	Do.	Do.	No. 9	Virtuewell 2′ 6″	Do.	6	40	10×5½	168	8×5½	162	2	738	6	1,430	Fur.	N.F.			
					No. 13	Do.	Do.	4	55	7×5½	81	5×5½	96	2	564	8	1,560	Fur.	N.F.			
					No. 7	Kiltongue	Do.	—	—	8×5½	205	5×5½	219	—	—	—	—	—	N.F.			
					No. 1, Langdales	Drumgray	Do.	—	—	13×5½	72	7×5	78	—	—	—	—	—	N.F.			
Dunlop, Colin, & Co.	Quarter	Hamilton	Lanark	Alex. G. Reid	No. 1	Main, 4′	S.	8	55	5×5	132	5×5	132	1	2,660	48	11,000	Fur.	F.		—	5
					No. 4	Do. Pyotshaw	Do.	8	54	—	—	12×5½	306	1	990	34	13,000	Fur.	F.			
					No. 5	Main, 4′	—	—	—	8×5½	114	4¾×5½	114	—	—	—	—	—	F.			
					No. 5	Splint, 5′	Do.	5	40	12×5½	192	4¾×5½	192	1	2,860	55	9,000	Fur.	F.			
					No. 6	Ell, 5′ 6″, Main	—	—	—	—	—	—	—	—	—	—	—	—	F.			
						Splint	Do.	5	36	12×5½	450	—	384	2	1,080	58	15,250	Fur.	F.			
					No. 7	Ell, 5′ 6″	Do.	10	85	11×6	450	9½×6	384	2	2,480	75	19,000	Fur.	F.			
						Splint	Do.	6	20	—	528	—	528	—	890	44	6,720	—	—			
Do.	Auchlochan	Lesmahagow	Do	Jno. Sloss	No. 1	Upper Coal	L.	12	32	5½×5½	104	11×5	240	1	600	24	7,750	Fur.	N.F.			
					No. 2	Splint	Do.	11	70	5½×5½	180	6½×6½	168	1	1,300	48	14,750	Fur.	N.F.		1	—
Dunn & Ure	Udston	Hamilton	Do.	D. Borland	No. 1	Ell, 5′, Main, 4′	S.	13	60	—	—	14×6	840	2	770	30	27,380	Fan	F.	Fan 20′ dia.	—	2
					No. 2	Ell, 5′	Do.	36	145	18×6	828	—	—	2	1,973	30	28,500	—	—			
Dunn, Brothers	Newlands	Bothwell	Do.	John Grant	No. 3	Main, 4′, Splint, 4′	L.	42	237	19×6	672	17×6	468	2	2,500	25	25,000	Fan	F.		—	6
Durie and Nisbit	Elphinstone	Tranent	Haddington	Robt. Henderson	Fleets	Great, 9′ 6″	S.	4	19	12×5½	216	9	128	1	1,020	30	4,100	Fur.	N.F.			
					Catherine	Splint and Parrot 5′ 6″.	Do.	}	—	11×5½	144	—	—	—	—	—	—	—				
							L.	}														
					Bog	Splint	Do.	15	54	—	—	7	66	1	1,729	40	5,690	Fur.	N.F.			
					Bog Mines	Do. and Parrot	Do.	1	27	6×5	—	5	30	2	660	16	4,000	Fur.	N.F.			
Drumshangie Coal Co.	Drumshangie	New Monkland	Lanark	Wm. Grant	No. 1	Virtuewell	Do.	—	—	16×5½	120	18×6	72	—	—	—	—	—	—			
					No. 3	Do.	Do.	4	24	9×5½	216	5×5½	120	1	1,000	42	7,600	Fur.	F.		—	—
					No. 5	Do. and Drumgray	Do.	5	30	14×5½	216	14×5½	216	1	400	42	8,000	Fur.	F.			
					No. 6	Do. and Kiltongue	S.	5	39	8×5½	222	6×5½	222	1	220	41	7,050	Fur.	F.			
					No. 7	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Darling, James	Calderhead	Shotts	Do.	Jas. Darling	High Pit	Shotts Gas	S.	4	14	4×4	Mine	11×5	84	1	750	12	1,900	Fur.	N.F.			
					Low Pit	Do.	L.	3	14	8×5½	69	5½×4	84	1	460	12	1,900	Fur.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Not-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Eaglesham, J.	Polton	Cockpen	Edinburgh	Hugh Rigg	No. 1	—	L.	—	—	—	—	—	—	—	—	—	—	—	—	Stopped.		
					No. 2	Rough, Splint, Parrot.	Do.	23	61	15×6	246	9×6	162	2	770	20	2,990	Fur.	N.F.			
					No. 3	Diamond, Jewel	Do.	14	49	12×6	198	—	—	2	486	25	3,315	—	N.F.			
Eddlewood Coal Co.	Eddlewood	Hamilton	Lanark	Alex. Jamieson	No. 1	Ell, 5′ 6″	S.	37	171	21×6½	606	—	—	3	1,540	45	54,000	—	F.	—	—	2
					No. 2	Do.		—	—	—	—	14⅓×6½	606	—	—	—	—	Fan	—	Fan 21′×7′.		
Erskine, W. C. C.	Kinnedder	Dunfermline	Fife	—	Lady Louisa	Splint, 20″.	L.	—	—	9×4½	56	9×4½	60	—	—	—	—	—	—			
Fife Coal Co. (Limited).	Beath & Blairadam	Beath	Fife	John Beveridge	No. 1 Beath	Five feet	Do.	20	53	—	—	9×5½	390	3	1,810	16	14,390	Steam	N.F.	Downcast is a mine 1,200 feet in length dipping 1 in 2½.	1	3
					No. 3	Main and Jersey	Do.	16	44	14×5½	260	14×5½	150	3	730	16	10,800	Fan	N.F.	Fan 18′ × 5′, 50 strokes per minute, 12″ cyl., 18″ stroke.		
						Do. and Bank Splint	Do.	30	130	16×8½	270	—	—	4	1,180	20	15,000	—	N.F.			
Do.	Leven	Methilhill	Do.	Thos. Moodie	No. 1	—	—	26	34	15×9	510	—	—	—	—	—	—	—	—	Sinking	1	—
					No. 2	—	—	—	—	—	—	19×10	450	—	—	—	—	—	—			
					No. 3	Wemyss, Parrot	Do.	13	70	15×5	360	15×5	162	3	830	16	9,592	Fur.	N.F.			
Forrester, Robt.	Roughrigg	New Monkland	Lanark	Alex. Park	No. 7	Splint, 2′	Do.	5	43	12×5	216	—	—	1	1,566	20	3,960	—	N.F.	—	1	—
					No. 8	Do.	Do.	3	56	7½×5	150	4½×5	168	1	1,833	20	5,000	Fur.	N.F.			
					No. 9	Do.	Do.	3	25	12×5	138	4½×5	168	1	1,732	19	2,200	—	N.F.			
					No. 10	Do.	Do.	4	36	9½×5½	228	4⅝×5½	234	2	700	19	4,300	Fur.	N.F.			
Do.	Dunmore	Airth	Stirling	—	No. 2	Two feet coal, 26″	Do.	—	—	7×5	162	5×5	186	—	—	—	—	—	—	Stopped.		
Frew, James (Trustees of late.)	Raploch	Dalserf	Lanark	James Frew	Raploch	Splint Main	S.	7	36	7¾×5	231	5×5	231	1	3,080	31	13,500	Fur.	N.F.			
Ferrier and Strain	Airdrie and Chapelside	New Monkland	Do.	Hugh Strain, jun.	No. 1	Drumgray	L.	5	15	—	—	12×5	420	1	500	25	—	Steam	F.	—	—	2
					No. 1	Kiltongue	Do.		16	—	—	—	420	1	1,850	20	—	Do.	F.			
					No. 2	Drumgray, 1 10″	Do.	11	34	12×5	360	—	—	1	800	20	5,000	Do.	F.			
					No. 2	Kiltongue, 3′ 6″	Do.		28	—	360	—	—	1	1,000	25	5,000	Do.	F.			
Forsyth, Wm.	Roughcraig	Do.	Do.	Wm. Forsyth	No. 1	Drumgray	Do.	5	12	8×5	180	6×5	180	1	100	24	4,000	Steam	F.	—	—	1
					No. 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
					No. 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Foulshiels Coal Co.	Foulshields	Whitburn	Linlithgow	James Ross	No. 1	Upper and Main	Do.	10	35	6×5	306	5½×5	324	3	760	24	9,600	Fur.	N.F.	—	—	1
	Stoneyburn	Do.	Do.	Do.	No. 1	Main	Do.	4	30	8×5	208	5×5	228	1	980	24	7,000	Fur.	N.F.			
Gartness Mineral Co., Limited.	Gartness	New Monkland	Lanark	Arch. R. Ormiston	No. 1	Virtuewell	Do.	5	17	10½×5½	57	10½×5½	57	2	580	22	5,500	Fan	F.	"Waddle," fan, 14½′.	—	2
					No. 2	Drumgray	Do.	9	40	—	342	—	330	4	460	27	16,590	—	F.			
Gibb Walter	Newarthill	Bothwell	Do.	W. Gibb	No. 1	Ell Coal 7′	S.	—	—	10×5½	156	13×5	180	—	—	—	—	—	—	Stopped temporarily.		
Gibb, McIntyre, & Ancell.	Auchinlea	Shotts	Do.	T. Gibb	No. 2	Virtuewell	L.	6	35	7×5	168	5×5	180	1	330	27	4,000	Fur.	N.F.			
Gemmell, Jas.	Auchingray	New Monkland	Do.	Jas. Gemmell	No. 1	Johnstone 2′ 4″	Do.	3	21	11½×5½	132	12×5½	132	2	120	30	6,600	Fur.	N.F.			
					No. 2	Lady Grange 2′	Do.	3	30	—	—	—	—	—	—	—	—	—	—			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Gemmell, Jas.	West Longrigg	New Monkland	Lanark	Jas. Gemmell	No. 1	Splint	L.	1	13	11½×5½	54	—	—	1	366	30	7,800	Fur.	N.F.	- - -	-	1
					No. 2	Do.	Do.	—	—	—	—	—	—	—	—	—	—	—	—			
					No. 3	Do.	Do.	4	57	—	—	11½×5½	87	1	200	30	—	Fur.	N.F.			
Do.	Easter Glentore	Do.	Do.	John Campbell	No. 1	Steam Coal	L.	4	18	6×5½	210	—	—	2	530	16	2,350	—	N.F.	- - -	-	1
					No. 2	Do.	Do.	4	18	6×5½	210	4½×5½	210	2	440	21½	2,500	Fur.	N.F.			
					No. 3	Virtuewell	Do.	3	19	8×5½	177	4×5½	177	1	100	12	5,000	S. jet	N.F.			
						Steam Coal	Do.	—	—	—	—	—	—	—	—	—	—	—	—			
Glasgow Iron Co.	Muirhouse	Cambusnethan	Do.	J. C. Muir	No. 2	Main, 4′	S.	8	15	9½×6	480	4⅔×6	480	3	160	16	6,255	—	F.	Newly sunk	-	2
Do.	Netherton	Do.	Do.	Do.	No. 4	Main, 5′	Do.	10	33	12×5½	570	—	—	1	3,500	16	6,897	Fan	F.	No. 3 is the upcast	-	1
Do.	North Netherton	Do.	Do.	Do.	No. 3	Main	Do.	8	27	—	—	11×5½	360	1	320	16	7,880	Fan	F.	Fan 21′×5′ 4″.		
Do.	Green	Do.	Do.	Do.	No. 7	Main, 5′	Do.	10	33	—	—	11×5½	372	1	3,600	16	8,022	Fur.	F.	Air from No. 4.		
Do.	Overjohnstone	Dalzell	Do.	Do.	No. 8	Main	Do.	14	61	—	—	5½×5½	342	1	1,840	16	5,906	Fur.	F.	- -	-	2
						Splint, 3′ 6″	Do.			5½×5½	420	—	—	1	2,420	16	6,058	—	—			
Do.	Shieldmuir	Cam'nethan	Do.	Do.	No. 9	Main, 4′	Do.	12	81	4½×5½	324	4½×5½	246	1	2,100	16	5,983	Fur.	F.	- - -	-	1
						Splint, 3′ 10″	Do.	—	—	—	450	—	—	1	2,200	16	6,126	—	F.			
Do.	Meadowhead	Dalzell	Do.	Do.	No. 5	Splint	Do.	3	10	11×5½	600	—	—	1	900	16	8,223	Fur.	F.	Discontinued.		
Do.	Ravenscraig	Do.	Do.	Do.	No. 6	Main, 5′	Do.	8	20	—	—	12×5½	402	1	1,720	16	17,185	Fan	F.	Fan, 21′×5′ 4″.		
Do.	Netherjohnstone	Do.	Do.	Do.	No. 10	Do. 4′ 8″	Do.	11	70	12×5½	450	—	—	1	3,700	16	13,270	Fan	F.	No. 6 is the upcast	1	—
Do.	Fairholm	Hamilton	Do.	Robt. Wilson	No. 13	Splint, 5′ 2	Do.	12	50	8×5½	180	5×4½	180	1	2,800	16	8,000	Fur.	N.F.	- - -	-	4
Do.	Gilmerton	Liberton	Edinburgh	Jno. McGowan	No. 24	No. 1 Ironstone	L.	20	56	12×5	480	9×5	300	1	1,400	30	8,704	Fan	N.F.	Fan 21′ dia.		
						North Grains	Do.															
Do.	Roslin	Lasswade	Do.	Do.	No. 34	Gas Coal	S.	25	70	7×6	546	7×6	546	1	1,320	25	6,250	St. jet	N.F.	- - -	-	1
Goodall, Bros.	Begg	Auchterderran	Fife	Wm. Goodall	Ronald	Black and Parrot	L.	8	56	9×5	246	9×5	150	2	950	16	6,500	Fur.	N.F.			
Goodall, J.	Cardenden	Do.	Do.	J. Goodall	No. 5	Duddy Davie	Do.	9	26	—	—	14×5	210	2	640	35	3,200	Fur.	N.F.			
					Adamjames	14 feet	Do.	3	19	8×4½	84	14×5	126	1	490	25	2,400	Fur.	N.F.			
					No. 8	Lochgelly Splint	Do.	4	16	11×5	270	—	—	1	650	16	1,300	Nat.	N.F.			
Grangemouth Coal Co.	Grangemouth	Bothkennor	Stirling	Wm. Swann	Zetland or No. 1	- - -	-	24	—	—	—	6′ 10″	240	-	—	—	—	Fan.	N.F.	Pumping and upcast shaft only.		
					Lady or No. 2	Splint and Coxrod	S.	7	50	12½	276	—	—	2	570	16	8,700	—	N.F.	"Waddle" Fan, 15 feet dia., at Zetland Pit.		
					Do	Thin Coal	L.	—	9	12	340	—	—	1	400	16	5,120	—	N.F.			
					Barony or No. 3	Splint, 3′ 3″	Do.	7	49	12	246	—	—	1	800	20	10,500	—	N.F.			
					Do.	Coxrod	-	—	26	—	320	—	—	1	700	21	5,180	—	N.F.			
					Palace or No. 4	Do. do. 3′ 4″	S.	7	25	12	180	—	—	1	730	16	7,400	—	N.F.			
								—	30	—	250	—	—	1	600	18	6,000	—	N.F.			
					Towncroft or No. 5.	Splint	L.	9	50	9	240	9	244	1	610	15	13,000	Fur.	N.F.			
						Crow	Do.	—	11	—	200	—	204	1	350	14	5,000	—	N.F.			
Gray, Thos.	Chapel	Cam'nethan	Lanark	W. Turner	No. 12 and 6	Virtuewell	Do.	12	52	13×5½	360	12×5½	270	2	600	20	14,000	Fan	F.	Fan 14′×4′.		
Gilchrist, Wm.	Stockwell	Carluke	Do.	W. Gilchrist	No. 1	Carluke Coal	Do.	3	20	4×3	95	4½×5½	180	1	400	20	2,075	Fur.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Grieve, J. and C.	Prestonlinks	Prestonpans	Haddington	J. Grieve	Prestonlinks	Great Seam	S.	9	20	6×5	400	5×4¼	400	1	2,000	18	4,690	Fur.	N.F.			
						Fire-clay			24	4×4	240	—	240	1	1,200	16	5,500	Fur.	N.F.			
Grieve and Nasmyth.	Donibristle	Aberdour	Fife	Alex. Nasmyth	Isabella	Five Feet, Mynheer	L.	—	14	9×5	288	9×5	212	1	460	20	10,000	St.	N.F.	- - -	1	2
						Five Feet	Do.	9	17	6×4	21	5×5	45	1	1,100	16	6,500	Fur.	N.F.			
						Dunfermline Splint	Do.	13	18	6×6	66	5×4	42	1	1,280	25	7,200	Fur.	N.F.			
					Marion	Main Parrot, 10′	S.	10	79	9×5	303	9×5	303	1	1,800	24	11,000	Fur.	N.F.			
					James	- - -	-	—	—	9×5	96	5×5	96	-	—	—	—	—	—			
Grierson, Thomas	Glebe	Douglas	Lanark	T. Grierson	No. 1 Mine	7 - -	S.	3	12	9×6	600	4×4	600	1	400	50	—	Fur.	N.F.			
Horne, R. R.	Mosshall	Bathgate	Linlithgow	W. Anderson	Latchbrae	Wilsontown Main	L.	—	—	5×5½	132	7×5½	132	-	—	—	—	—	—	Pit stopped.		
Do.	Torbanehill	Do.	Do.	Do.	Nos. 3, 4, 7, and 8.	Main Coal & Torbane-hill Mineral.	Do.	—	—	6½×5½	180	6½×5½	102	-	—	—	—	—	—	Pits stopped.		
Do.	Knowton	Shotts	Lanark	Jas. Williamson	No. 1	Shotts Virgin	Do.	—	—	5×5½	60	5×5½	60	1	600	16	2,800	—	N.F.	Pit stopped.		
Hamilton Coal Co.	Greenfield	Hamilton	Do.	James Hastie	No. 1	Ell Coal, 7′	S.	54	260	17×6	876	8×6	852	2	4,580	50	30,000	Fan	F.	"Waddle" fan, 30′ diam., 24″ cyl., and 4′ stroke. 70 strokes per min.	1	2
					No. 1	Splint, 3′ 9″	Do.	—	—	—	—	—	—	2	832	40	18,000	—	F.			
					No. 2	Main Coal, 4′	Do.	—	—	10×6	852	—	—	2	2,200	40	20,000	—	F.			
Hamilton, McCulloch, & Co.	Bog	Do.	Do.	Alex. Ross	Nos. 1 and 2	Ell, Main, & Splint	Do.	35	120	14½×6	450	11×6	447	2	6,050	60	30,000	Fur.	F.	- - -	-	2
									—	—	504	—	504	-	—	—	—	—	—			
									70	19½×6	582	11½×6	582	2	2,800	60	13,200	Fur.	F.			
Do.	Home Farm	Do.	Do.	Do.	Nos. 1 and 2	Ell, 6′	Do.	15	43	14½×6	282	11½×6	282	1	4,120	60	30,000	Fur.	F.			
Hay, Matthew, and Sons.	Stanerigg	Slamannan	Stirling	Jno. McCulloch	No. 2	Coxrod	L.	—	—	10×5	60	—	—	-	—	—	—	—	—			
					No. 3	Do., 23″	Do.	8	34	—	—	12×5	70	1	1,230	20	1,800	Fur.	N.F.			
Haywood Gas Coal Co.	Haywood	Carnwath	Lanark	Jas. Robertson	Tashieburn	Gas Coal	Do.	2	12	—	—	7×5½	129	1	1,596	12	4,785	Fan.	N.F.	Fan. 15′ dia.	-	5
					No. 2	Do., 22″	Do.	—	—	13×5½	456	5½×5	180	-	—	—	—	—	—			
					No. 4	Do.	Do.	9	44	12½×6	462	—	—	2	2,176	14	8,730	—	N.F.			
					No. 5	Do.	Do.	—	—	12×5½	294	—	—	-	—	—	—	—	—			
					No. 5	Main Coal, 4′ 4″	S.	8	47	16×5	288	5½×5	294	2	2,000	22	15,382	Fan	N.F.	Fan. 10′ dia.		
					No. 6	Do.	Do.	—	—	5×5½	300	5½×5½	312	-	—	—	—	—	—			
					No. 8	Gas Coal, 18″	L.	—	52	—	270	—	288	1	2,180	18	6,930	Fan.	N.F.			
					No. 8	Main Coal	S.	13	21	14×5	108	16×5½	125	1	1,480	33	9,860	Fur.	N.F.			
					No. 9	Gas Coal	L.	3	11	6×5	288	4×5	288	1	420	16	5,000	Fur.	N.F.			
					No. 10	Do.	Do.	15	117	16×5½	285	7×5½	129	2	1,788	18	10,816	Fan.	N.F.	Fan. 15′ dia.		
					No. 11	Main Coal	S.	4	31	14×5	102	16×5½	125	1	1,488	33	6,000	Fur.	N.F.			
					No. 13	- - -	-	—	—	8×5½	—	4×5½	—	-	—	—	—	—	—			
Henderson, G. W. M.	Fordell	Dalgetty	Fife	Thos. Falconer	Cuttlehill, No. 9	Blawlowan	L.	5	18	10½×5½	342	6½×6½	282	2	980	33	8,060	Fur.	N.F.	Stopped Sep. 1878	-	1
					Do. William	Splint	Do.	11	61	10½×5½	342	6½×6½	282	2	2,090	33	14,100	Fur.	N.F.			
						5 feet & Mynheer, 5′	Do.															
					Prathouse, No. 3	Blawlowan	Do.	—	—	10	120	10×5	132	-	—	—	—	—	—			
					Do. No. 4	Splint	Do.	8	49	12×5	72	12×5	76	2	—	—	—	—	N.F.			
						Mynheer, 3′	Do.								—	—	—	—	N.F.			
						Blawlowan, 7′	S.								500	30	11,980	Nat.	N.F.			
					Lady Anne	Five Feet, 5′ 6″	Do.	6	38	10	288	6½×6½	282	1	1,820	30	1,045	Fur.	N.F.			
						Mynheer	Do.															
						Blawlowan	-	—	—	—	—	—	—	-	—	—	—	—	—			
					Vengence	Splint	L.	3	11	8	130	8	140	1	150	40	4,000	Nat.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated. Parish.	Where situated. County.	Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed. Above Ground.	No. of Persons employed. Below Ground.	Size and Depth of Downcast and Upcast Shafts. Downcast. Size in Feet.	Downcast. Depth in Feet.	Upcast. Size in Feet.	Upcast. Depth in Feet.	Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
															yards.	feet.						
Hendrie, Jno.	Maryville	Bothwell	Lanark	Jas. McNeil	No. 1	Main, 3′ 8″, Pyotshaw, 3′ 6″.	S. & L.	14	60	21×6	489	—	489	3	1,700	20	4,400	—	F.	- - -	—	1
										—	510	—	510	—	—	—	—	—	F.			
					No. 2	Splint, 3 3″	Do.	—	40	—	600	11×6	600	1	600	24	7,200	Fan	F.	Fan. 15′ dia.		
Do.	Haughhead	Do.	Do.	Do.	No. 1	Do., Virgin	S.	3	6	13½×6	1,044	7½×6	1,044	2	650	50	5,000	—	F.			
Herd, Walter	Dunnikier	Kirkcaldy	Fife	Peter Herd	Smeaton	3 feet	L.	3	20	13×5	162	4×6	120	2	680	14	2,000	Fur.	N.F.	Stopped May 1878	1	—
					Lena	Black and Parrot	Do.	6	38	13×5	440	4½×5	440	2	760	25	12,000	Fur.	N.F.			
					St. Clair	Do.	Do.	4	36	9½×5	396	—	—	1	640	25	5,000	Fur.	N.F.			
					Spithead	Do, 20″, Smithy	Do.	2	7	9×5	162	6×4	132	1	320	12	3,000	—	N.F.			
Hood, Archd.	Dalhousie	Cockpen	Edinburgh	John Begg	Dalhousie	Splint, Jewel, Diamond.	Do.	16	90	10	200	10	212	3	1,786	25	9,000	Fur.	N.F.	- - -	—	1
						Rough Parrot	S.															
					Whitehill	Jewel	L.	—	—	10×6	90	8	90	3	—	25	—	Fan	N.F.	"Guibal" fan, 9′ dia., 4½′ wide. 80 to 100 strokes per min. W.G.		
						Parrot Rough	Do.															
Do.	Whitehill and Gorton.	Lasswade	Do.	Do.	Engine	Great, 6′	S.	64	170	11½×6	240	10	224	2	2,500	35	18,000	Fur.	N.F.	- - -	—	1
						Diamond	L.			10	312	—	—	—	—	—	—	—	N.F.			
						Splint	Do.			10	312	—	—	—	—	—	—	—	N.F.			
Hudspith, W., & Co.	Green	Cam'nethan	Lanark	Henry Danks	No. 4	Splint, 5′	S.	11	43	—	—	14×6	480	2	1,500	30	8,500	Fur.	F.			
					No. 5		—	—	—	9×6	480	—	—	—	—	—	—	—	F.			
Hutchison, Jos.	Woodside	Dalserf	Lanark	John Wardrop	No. 2, Woodside	Main, 4′	Do.	5	35	10×	222	9×5	222	3	680	32	8,000	Fur.	N.F.	- - -	—	1
					No. 3	Splint, Ell, 5′ 9″, 4′ 6″.	Do.	6	44	8×6	388	6×6	400	1	1,470	36	4,500	Fur.	N.F.			
Huttonhill Coal Co.	Huttonhill	Rothwell	Lanark	Jno. McCulloch	No. 1	Main, Splint	Do.	6	12	7×5	306	5×4½	306	2	550	16	7,000	Fur.	F.	- - -	—	1
Johnstone, W. & R.	Edgehead	Dalkeith	Edinburgh	W. Johnstone	-	-	—	4	14	—	—	—	—	—	—	—	—	—	—	Gin Pit.		
Kirk and Grieve	Over Inzievar	Culross	Fife	W. Kirk	Mines	Gas	Do.	1	5	4×3	—	4×3	—	2	130	12	2,200	—	N.F.			
Kerr, Thos., and Co.	Waterlands	Carluke	Lanark	Henry Stewart	No. 1	Kiltongue	L.	—	—	9×5½	102	5×5	60	—	—	—	—	—	—	Standing.		
Kerr and Mitchell	Glenclelland	Dalzell	Do.	Thos. Borland	No. 1	Main	S.	20	84	5×5½	338	8×5	204	1	1,700	60	15,000	Fur.	F.			
					No. 1	Splint	Do.			6½×5½	412	—	278	1	1,400	29	5,800	—	F.			
					No. 2	Ell	Do.			10×5½	280	—	182	1	800	48	10,000	—	N.F.			
					No. 3	-	—	—	—	—	—	—	—	—	—	—	—	—	—	Upcast.		
Lacour and Watson.	West Limerigg	Slamannan	Stirling	G. Pitcairn	No. 1	Splint, 2′ 2″	L.	5	13	7½×5½	270	4¾×5½	270	2	600	16	5,100	Fur.	N.F.			
					No. 2	Do.	Do.	5	34	5×5	246	5×5	246	1	2,300	16	4,700	Fur.	N.F.			
Lassodie Coal Co.	Lassodie	Beath	Fife	J. Brownlie	No. 3	Splint	S.	—	—	12×5½	180	—	—	—	—	—	—	—	—	- - -	1	—
					No. 4	8 feet	Do.	13	21	8×6	300	6×6	315	1	900	40	6,000	Fur.	N.F.			
					No. 6	5 feet, Splint	Do.	15	45	11½×6	420	8×6	420	2	850	22½	4,500	Fur.	N.F.			
					No. 9	5 feet, Splint	Do.	42	157	—	—	12½×5½	270	3	1,080	22	10,900	Fur.	N.F.			
Limerigg Coal Co. (Limited).	Limerigg & West Drumclair.	Slamannan	Stirling	Wm. Roy	No. 1	Splint	L.	3	30	7½×5	282	4¾×5	294	1	400	12½	4,500	Fur.	N.F.	- - -	—	1
					No. 2	Coxrod	Do.	—	—	7½×5	282	4¾×5	282	—	—	—	—	—	—			
					No. 3	Do.	Do.	—	—	7½×5	228	—	—	—	—	—	—	—	—			
					No. 4	Splint	Do.	2	26	—	—	4¾×5	248	1	500	12	4,600	Fur.	N.F.			
					No. 5	Coxrod, Lady Grange.	Do.	6	55	12×5½	300	2¾×5½	300	2	400	10	6,000	Fur.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Lochore and Capledrae Cannel Coal Co. (Limited).	Lochore and Capledrae.	Ballingray	Fife	Duncan Ferguson.	Capledrae Mine	Capledrae Cannel	S.	9	42	8×5	1,380	12×5	1,380	1	1,380	29	9,600	Fan	N.F.	Fan 15′ dia.		
					Do. No. 3	Do.	Do.	7	30	8×6	1,146	6×6	1,146	1	420	23	7,200	Fan	N.F.			
Logan, John & Sons	Candie	Muiravonside	Stirling	M. Osborne	No. 1	Coxrod	L.	—	26	—	—	—	—	—	—	22	3,300	—	—			
					No. 2	Do.	Do.	—	16	—	—	—	—	—	—	18	4,320	—	—			
Lesmahagow and Longlee Coal Co.	Blackwood	Lesmahagow	Lanark	John Wardrop	No. 1	Gas Coal 22″	Do.	—	—	9½×6	444	—	—	—	—	—	—	—	—	Stopped.		
					No. 2	Do.	Do.	—	—	—	—	13×6½	330	—	—	—	—	—	—			
Do.	Stevenston	Bothwell	Do.	Wm. Aitken	No. 5	Main, 4′	S.	7	52	—	—	13×4½	310	1	2,820	30	12,600	Fur.	F.	Standing.	1	2
					No. 7	Virtuewell		—	—	12×5	432	—	—	—	—	—	—	—	—			
					No. 8	Main, 4′		—	—	14×5	346	—	—	—	—	—	—	—	—			
Lothian, Marquis of.	Newbattle	Newbattle	Edinburgh	Jas. Stevenson	Shaws	Parrot	L.	5	22	10×6	198	8	222	1	1,333	30	14,520	Fur.	N.F.		1	2
					Lingewood	Great	Do.	48	360	16×11	900	10	240	1	4,100	42	124,190	Fan	N.F.	"Guibal" fan, 30 ft. dia., 10 ft. wide. Speed 42 rev. per min.		
					Do.	Splint	Do.			14×6	624	—	—	1	4,166	33			N.F.			
					Engine	Kaleblades	Do.							1	2,000	45			N.F.			
					Do.	Parrot	Do.							1	6,299	36		—	N.F.			
					Bryans	Great	Do.	17	79	12×4½	360	8	195	1	1,416	30	8,050	Fur.	N.F.			
						Coronation	Do.							1	1,216	30	5,150	Fan	N.F.			
						Splint	Do.							—	—	—	—	—	—			
						Parrot	Do.							1	3,866	39	20,450	Fur	N.F.			
Do.	Dalkeith	Dalkeith	Do.		No. 2, Cowden	Siller Willie	Do.	50	189	14×10	630	9	192	2	2,100	52	17,200	Fur.	N.F.	Furnace on surface.	—	2
					No. 3, Cowden	Parrot 7′ 2″ Great, Coronation.	Do.							1	1,630	30	6,300	—	N.F.			
														2	3,566	33	—	—	N.F.			
Lochgelly Iron and Coal Co.	Lochgelly	Auchterderran	Fife	S. Macdonald	Eliza	Parrot, 4′, Splint 3′ 6″.	Do.	40	204	14×9	600	11×8½	309	3	1,848	30	17,000	Fur.	N.F.		2	1
					Mary	Do. do.	Do.	—	—	18×6	150	14½×6	180	—	—	—	—	—	—			
Do.	Foulford	—	Do.	Do.	Foulford	Do. do.	Do.	25	132	12×5	180	13¼×8¾	432	1	2,400	35	12,000	Fur.	N.F.		—	1
					No. 16	Mynheer, 5 feet	Do.	—	—	11×5	100	6½×5	45	—	—	—	—	—	—			
					No. 18		Do.	—	—	9×5	82	7×5	86	—	—	—	—	—	—			
Do.	Raith	—	Do.	Do.	Lady	Splint, Parrot, 5 ft.	S.	46	153	—	—	17×5½	480	4	1,518	40	62,820	Fur.	N.F.		—	1
					Dora	Dunfermline Splint	L.	25	154	11×8½	600	—	—	—	—	—	—	Fur.	N.F.			
Loganlea Coal Co.	Loganlea	West Calder	Edinburgh	Alex. Russell	No. 1	3 feet, Main	S.	7	13	—	—	12×5	220	2	372	30	3,750	Fur.	N.F.		—	2
						Wilsontown Main Coal 6′.	Do.	—	18	—	—	—	—	1	682	30	7,200	—	N.F.			
					No. 2	3 feet, Main	Do.	—	7	—	276	—	—	1	372	30	4,500	—	N.F.			
						Wilsontown Main	Do.	8	51	15½×5½	342	—	—	—	—	—	—	—	—			
Lumphinnans Iron Co.	Lumphinnans	Ballingray	Fife	Peter Cummings	No. 1	Lochgelly, Splint Parrot, 14 feet.	L.	20	80	15×5½	612	10×5½	450	3	1,316	38	36,240	Fan	N.F.		1	—
					No. 7	5 feet, 4′ 2″, Dunfermline Splint.	Do.	16	67	15×5½	612	10×5½	450	2	1,664	31	28,440	—	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size, and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
		Parish.	County.					Above Ground.	Below Ground.	Downcast. Size in Feet.	Downcast. Depth in Feet.	Upcast. Size in Feet.	Upcast. Depth in Feet.		yards.	feet.						
Lumsden, Mrs. Th.	Drumhead	Cameron	Fife	—	Sarah	Splint and Parrot	L.	4	14	11×4½	156	8×4	60	2	520	12	8,000	Fur.	N.F.			
Macdonald, Jno.	Haughhead	Hamilton	Lanark	John Love	No. 1	Ell, 4′ 10″	S.	10	58	18×6	582	—	—	1	280	25	12,000	Fan.	F.	Fan 18′×6.	2	2
						Main, 4′ 8″	—	—	—	—	—	—	—	2	2,780	49	12,000	—	F.			
					No. 2	Splint, 5′ 6″	Do.	8	81	—	—	11×6	438	1	960	18	9,000	—	F.			
McAllister, Robt.	Roadside	New Monkland	Do.	Robt. McAllister	No. 3	Drumgray	L.	2	15	6×4½	180	4×4½	200	1	400	18	8,000	Fur.	N.F.			
McAndrew, J., & Co.	Shields and Dalze	Dalzell	Do.	Thos. Whitelaw	Shields	Main, Ell	S.	—	—	12×6	420	6×4	420	—	—	—	—	—	—	—	2	1
					Dalzell No. 2	Do. 4′ 4″	Do.	40	105	12×5½	255	6×4	174	2	1,400	24	18,000	Fur.	F.			
					Do. No. 3	Do. 4′ do. Pyotshaw & Splint.	Do.	37	124	13×5½	246	6×4	174	4	1,500	24	32,000	Fur.	F.			
McCallum, John & A.	Raebog	New Monkland	Do.	Alex. Ferguson	No. 1	Drumgray	L.	—	—	12×5	108	12×5	150	—	—	—	—	—	—			
					No. 2	Do. and Kiltongue.	Do.	10	40	6×5	60	4½×5	60	2	580	20	7,000	Fur.	N.F.			
Do.	Blackrigg	Do.	Do.	Do.	No. 1	Humph	Do.	2	8	4×3½	21	8×4½	21	1	400	12	6,000	Fur.	N.F.			
					No. 2	Musselband	Do.	4	22	10×4½	46	12×5	96	1	130	18	7,000	Fur.	N.F.			
McNaughton, Jas., Son, and Co.	Netherjohnstone	Dalzell	Do.	John Hislop	Garibaldi No. 1	Main 4′ 6″	S.	9	28	—	408	15×5½	408	2	500	36	18,300	Fan.	F.	Fan 16 dia. × 6′.		
					Do. No. 2	Splint 5′	Do.	13	80	12×5½	480	—	480	2	700	40	18,300	—	F.			
McNaughton, D., & Co.	Broomhill	Dalserf	Do.	D. McNaughton	No. 2	Virtuewell 2′	L.	4	10	10×4½	84	10×4½	66	2	375	18	8,000	Fur.	N.F.			
Merry & Cunninghame.	Craigneuk	Cam'nethan	Do.	David Anderson	Wellington	Main Coal 4′ 6″	S.	11	77	8×5½	304	5×5½	304	2	1,120	21	9,000	Fur.	F.	—	1	1
						Splint 4′	Do.			—	388	—	388	2	1,140	16	7,700	—	F.			
Do.	Sunnyside	Dalzell	Do.	Do.	No. 4	Do. 4′	L.	7	53	12½×5½	318	—	—	1	1,452	33	8,000	Fur.	F.			
					No. 6	—	—	—	—	—	—	9×5½	354	—	—	—	—	—	—			
Do.	North Motherwell	Hamilton	Do.	John Hogg	No. 1	Ell, Splint, Pyotshaw.	S.	16	100	14×6	534	—	—	3	1,410	55	36,000	Fur.	F.	—	1	2
					No. 2	Splint	Do.	8	60	—	—	18×6	456	2	1,000	28	18,000	Fur.	F.			
Do.	Auchenraith	Blantyre	Do.	Wm. Wilson	No. 1	Ell, 4′ 8″	Do.	33	126	23×7	720	—	—	5	1,800	42	70,210	Fan.	F.	Fan. 30′×10′	1	2
					No. 2	Main, 4′, Splint, 6′ 6″, and Pyotshaw, 4′.	Do.	13	82	—	804	23×7	804	1	856	44	14,124	—	F.			
							Do.	—	—	—	804	—	834	2	1,732	47	43,136	—	F.			
							L.	—	—	—	869	—	869	2	1,595	46	54,360	—	F.			
Merryton Coal Co.	Merryton	Hamilton	Do.	David Seggie	No. 1	Ell, 5′	S.	17	45	15×6	420	21×6	420	1	2,000	20	10,000	Fan.	F.	Fan. 17′×6′.		
					No. 2	Main, 4′ 4″	Do.	3	30	—	500	—	500	2	2,600	54	22,000	—	F.			
						Splint, 5′ 5″	Do.	12	55	—	600	—	600	2	3,200	50	18,000	—	F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Monkland Iron & Coal Co. (Limited).	Armadale	Bathgate	Linlithgow	Robt. Martin	No. 15	Ball Coal, 2′ 3″	L.	4	20	7½×5	196	5×5	229	1	700	14	1,660	Fur.	N.F.	Ironstone also worked.		
Do.	Chapelhall	New Monkland	Lanark	James Muir	No. 3	Main Coal	Do.	—	—	7×5	270	5×5	270	–	—	—	—	—	—	Ironstone also worked.		
					No. 4	Lower Drumgray	Do.	4	15	8×5	732	4½×5	720	1	1,000	20	3,000	Fur.	F.			
					No. 5	Do. do. 2′ 10″ / Upper do. 2′ 8″	Do.	—	—	9×5	636	—	—	–	—	—	—	—	—			
					No. 8	Lower Drumgray	Do.	3	22	9×6	228	6×4	240	1	800	20	3,000	Fur.	F.			
Do.	Tannochside	Bothwell	Do.	C. Jamieson	No. 1	Splint and Gas, 5′	S.	23	135	21×5½	720	—	—	4	1,200	20	45,000	Fan	F.	Fan 20′ dia.	—	3
					No. 2	Main, 3′ 8″, Pyotshaw, 3′ 8″.	L.	12	103	—	—	15×5½	720	–	—	—	—	—	F.			
Do.	Cleland	Do.	Do.	Thos. Campbell	No. 18	Ell, 5′ 6″	S.	6	18	10×5	57	—	—	1	500	33	7,000	Nat.	N.F.	- - -	—	2
					No. 19	Main, 6′	Do.	4	30	6×4	36	12×5	72	1	440	42	9,000	Fur.	N.F.			
Do.	Thankerton	Do.	Do.	Robt. Young	No. 1	Pyotshaw	L.	5	24	14×5	136	5×4	78	2	2,550	13	7,000	Fur.	F.	- - -	—	1
					No. 2	Do.	Do.	8	43	7×5	274	5×4½	274	1	1,300	11	6,000	Fur.	F.			
					No. 3	Main	S.	5	34	7×5	66	5×4½	78	1	1,500	13	4,300	Fur.	F.			
					No. 4	Virtuewell, 2′	L.	8	53	5×4½	312	6½×5	327	2	1,800	12	10,000	Fur.	F.			
					No. 5	Do.	Do.	5	31	5×4½	189	5×5	199	1	2,050	12	4,500	Fur.	F.			
Do.	Bankend	Lesmahagow	Do.	Jno. Adam	No. 5	Dross Coal	Do.	4	20	12×5	156	4×5	36	1	196	12	1,245	Nat.	N.F.			
Do.	Spindleside	Shotts	Do.	Robt. Condie	No. 1	Virtuewell, 2′ 6″	Do.	9	55	—	—	15×5	204	2	600	30	15,800	Fan.	N.F.	Fan 10′ dia.		
					No. 2	Do.	Do.	14	63	12×5½	264	—	—	–	—	30	—	—	N.F.			
Morningside Coal Co.	Allanton	Cam'nethan	Do.	Jas. Knox	No. 1	Lower Drumgray	S.	—	—	8½×5½	190	5×5½	190	–	—	—	—	—	—			
					No. 2	Do., 3′ 8″	L.	9	45	12×5	330	14×5	291	2	615	37	13,896	S. jet.	F.			
Mossend Iron Co.	Orbiston	Bothwell	Do.	J. Wotherspoon	No. 1	Pyotshaw, 3′ 6″ / Main, 3′ 8″, Splint, 5′ 4″	Do. / S. / Do.	7	40	12½×6	690 / 720 / 804	13½×6	690 / 720 / 804	1 / 2 / 2	1,330 / 1,200 / 1,300	20 / 20 / 45	5,500 / 9,500 / 10,000	— / — / —	F. / F. / F.	Fur. in Ell Coal for both Pits.		
					No. 2	Ell, 6′ 6″	Do.	8	68	—	—	13½×6	660	3	1,400	45	15,300	Fur.	F.			
Do.	Hattonrig	Do.	Do.	Jas. Munro	No. 3	Splint, 3′ 8″	L.	11	100	15½×6	810	—	—	2	1,735	20	11,300	—	F.	Fur. in Ell Coal No. 4 for both Pits.	1	1
					No. 4	Pyotshaw, '3′ 8″, Main, 3′ 8″.	Do.	11	98	—	—	8½×5½	726	2	1,100	20	10,300	Fur.	F.			
Millar, William	Fairybank	New Monkland	Do.	Wm. Millar	No. 1	Lower Drumgray	Do.	—	—	10×4½	42	6×4	42	1	720	12	2,400	Fur.	N.F.			
					No. 2	Do., 2′ 4″	Do.	6	31	8×5	46	4×5	46	1	88	14	2,000	—	—			
Millen, William	North Linrig	Shotts	Do.	R. Williamson	No. 1	Upper Drumgray, 2′ 3″.	Do.	4	35	16×5	75	12×5	75	1	1,000	20	2,000	Fur.	N.F.	- - -	—	1
					No. 2	Main and Pyotshaw, 9′.	S.	—	—	6×5½	66	4½×5½	66	–	—	—	—	—	—			
Miller and Rodger	Swinhill	Dalserf	Lanark	Matthew Walker	No. 3	Virtuewell, 2′ 4″	Do.	2	24	7½×5½	84	5×5½	98	3	775	22	10,500	Fur.	N.F.			
					No. 3	Kiltongue	L.	3	45	—	240	—	276	4	680	20	14,000	Nat.	N.F.			
					No. 2	Upper Drumgray	Do.	5	37	7½×5½	281	5×5½	321	4	528	22	15,000	Fur.	N.F.			
						Under Do.	Do.	5	37	—	305	—	345	2	610	22	12,500	—	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Napier, Jas.	Riggend	New Monkland	Lanark	Ed. Gillespie	No. 2	Drumgray Kiltongué	L. Do.	3 —	13 —	12×5 —	162 —	12×5 —	132 —	2 –	745 —	20 —	3,750 —	Fur. —	N.F. —			
Nasmyth, Alex.	Dundonald	Auchterderran	Fife	A. Nasmyth, jun.	No. 2 or West No. 3 or Engine	Glass Coal Lochgelly Splint	Do. Do.	5 15	34 44	— 14×6	— 360	9×5½ —	330 —	1 1	1,150 1,200	20 20	4,100 4,350	Steam —	N.F. N.F.			
Nimmo, Jas., & Co.	Longrigg	Slamannan	Stirling	Robt. Wilson	No. 1 No. 1 No. 2	Splint, 22″ Coxrod Splint	Do. Do. Do.	6 — 4	27 62 52	6×5 7×5 7×5½	150 234 162	5×5 5×5 5×5½	160 234 162	1 2 2	1,840 808 510	12 12 12	4,480 7,600 5,300	Fur. Fur. Fur.	N.F. N.F. N.F.			
Do.	Lochend	Do.	Do.	Do.	No. 1 No. 2 No. 3	Splint, Ladygrange Do. Ladygrange	Do. Do. Do.	4 4 4	32 45 36	10×5 — 7½×5½	264 — 84	— 10×5 5×5½	— 240 84	2 – 1	1,000 — 840	15 — 11	5,600 — 5,500	Fur. — Fur.	N.F. N.F. N.F.			
Do.	Longriggend	Do.	Do.	Geo. Brown	No. 1 No. 2 No. 3 No. 4	Splint Splint Virtuewell Splint	Do. Do. Do. Do.	2 — 4 2	22 — 60 30	7½×5½ 7×5½ 12×5 12×5½	222 51 80 222	6×5½ 6×5½ 7½×5 6×5½	211 51 80 211	2 – 2 2	1,020 — 430 340	12 — 15 12	5,300 — 6,000 8,000	Fur. — Fur. Fur.	N.F. — N.F. N.F.	- - -	—	3
Do.	Kippbyre	New Monkland	Lanark	George Anderson	No. 3 No. 5 No. 7 Mine	Virtuewell, 2′ 8″ — Do.	Do. — Do.	— — 7	— — 46	12×5 — 4×4	102 — —	5×4½ — 5×4	60 — 102	– – 1	— — 354	— — 12	— — 5,234	— — Fur.	— — F.			
Do.	Muiravonside	Muiravonside	Linlithgow	Jno. Murray	No. 1 No. 2 No. 3 No. 4	Splint Do. Do. Do., Coxrod	Do. Do. Do. Do.	— — 1 4	— — 9 36	7½×5½ 7½×5½ 7×5½ 7×5½	156 168 108 162	5½×5 5½×5 5½×5 5½×5	156 168 108 162	– – 1 2	— — 640 366	— — 20 17	— — 3,900 7,900	— — Fur. Fur.	— — N.F. N.F.			
Do.	Lochouse	Slamannan	Stirling	Jas. Maxwell	Lochouse Drumclair	Do. Coxrod, 21″	Do. Do	4 4	20 32	7½×5 12×5	162 240	5×5 5×5	162 240	1 1	2,000 1,000	20 12	4,200 4,700	Fur. Fur.	N.F. N.F.	- - -	1	1
Nimmo, John, and Son.	Limerigg Lochside	Do.	Do.	Robt. Grant	No. 2 No. 3 No. 2 No. 4	Virtuewell Johnston Coal Lady Grange Do.	Do. Do. Do. Do.	5 — 12 —	14 — 44 —	8×5 7×5 5×5 5×5	72 60 120 240	4½×5 4½×5 4½×5 6×5	60 60 105 45	2 1 1 –	1,090 1,850 1,280 —	14½ 15½ 16 —	4,700 4,230 4,950 —	Fur. Fur. Fur. —	N.F. N.F. N.F. —			
Do.	Drumriggend	Do.	Do.	Do.	Nos. 1 and 2	Splint Lady Grange Coxrod	Do. Do. Do.	7 6 3	12 48 56	8×5½ 8×5½ —	78 120 168	7×5½ 7×5½ —	108 105 198	2 1 2	120 1,300 1,230	15 16 15	5,400 5,000 5,000	Nat. Nat. Fur.	N.F. N.F. N.F.	- - -	—	1
Nitshill and Lesmahagow Coal Co.	Auchinheath	Lesmahagow	Lanark	J. Lancaster	Auchinheath	Lesmahagow Cannel, 20″.	Do.	—	—	11×4½	300	10×6½	606	–	—	—	—	—	—			
Do.	Braidholm	Do.	Do.	Do.	Braidholm	Do., 21″	Do.	54	180	20×6½	684	10	675	3	2,670	26	19,000	Fan.	F.	- - -	1	—
Do.	Southfield	Do.	Do.	Do.	Southfield	Do., 20″	Do.	109	240	16½×5½	708	—	—	8	1,500	29	71,700	—	F.	- - -	1	—
Do.	Fence	Do.	Do.	Do.	Fence No. 1 Do. No. 2	Do., 21″	Do.	74 —	151 —	— 12	— 1,050	13 —	1,050 —	2 –	900 —	60 —	37,800 —	— —	F. —	- - -	1	—
Omoa and Cleland Iron and Coal Co. (Limited).	Cleland	Shotts	Do.	Robt. Addie	No. 1 No. 40 No. 43	Ell Do. Main Do.	S. Do. Do.	— — 3	— — 20	5½×5½ 4½×7½ 8½×6	Mine 210 336	5×5 4½×4½ 5×6	72 210 336	1 1 1	854 510 500	20 25 50	4,600 7,000 4,500	Fur. Fur. Nat.	N.F. N.F. N.F.	- - -	—	1
Do.	Wyndedge	Do.	Do.	Do.	No. 4 No. 5	Virtuewell Do.	L. Do.	3 4	33 33	9×5½ 4½×5½	216 147	4½×5½ 4½×5½	216 147	1 3	262 300	12 12	6,000 5,400	Fur. Fur.	N.F. N.F.			
Do.	Langbyres	Do.	Do.	Do.	No. 1	Do.	Do.	—	—	4½×5	102	4½×5	102	–	—	—	—	—	—			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
		Parish.	County.					Above Ground.	Below Ground.	Downcast. Size in Feet.	Downcast. Depth in Feet	Upcast. Size in Feet.	Upcast. Depth in Feet.		yards.	feet.						
Paul, Gavin	Climpy	Carnwath	Lanark	James Mackay	No. 3	Climpy Main	L.	4	30	9×6	408	6×5½	420	1	350	21	14,000	Nat.	N.F.			
Do.	Wilsontown	Do.	Do.	James Paul	No. 3	Gas Coal	Do.	3	38	8×5	174	4×5	182	2	1,500	20	3,800	Fur.	N.F.		1	1
					No. 6	Do.	Do.	—	—	7×5	78	4×5	84	—	—	—	—	—	—			
					No. 7	Do.	Do.	—	—	9×6	243	4×6	252	—	—	—	—	—	—			
					No. 8	Do.	Do.	3	27	10×6	300	6½×6	313	2	1,150	28	6,200	Fur.	N.F.			
					No. 9	Do.	Do.	8	81	9×6	390	7×6	399	2	1,340	20	8,100	Fur.	N.F.			
Do.	Mosside	Bathgate	Linlithgow	W. Annan	No. 1	Balbardie	Do.	4	14	9×6	84	5½×6	94	2	180	22	3,000	—	N.F.			
					No. 2																	
Provanhall Coal Co.	Bredisholm	Bothwell	Lanark	John Reid	No. 2	Pyotshaw, Main	Do.	19	171	—	—	—	—	2	2,800	18	17,920	Fan.	F.	"Waddle" fan, 15′ dia. at No. 3.	—	3
						Splint	S.	—	—	20×5⅔	864	18×5½	1,014	1	638	16	9,430	—	F.			
					No. 4	Do.	—	8	77	14×5⅔	600	—	—	2	2,060	18	8,425	—	F.			
					No. 3	Kiltongue	Do.	8	59	—	858	18×5½	1,014	2	1,333	72	14,033	Fan.	F.	"Guibal" fan, 20 ft. dia.		
Prestongrange Iron and Coal Co. (Limited).	Prestongrange	Prestonpans	Haddington	J. M. Hunter	No. 1, Dolphingston.	No. 1, Jewel	L.	3	73	10	432	7½×6½	360	1	1,800	16	5,000	Fur.	N.F.			
						Diamond	Do.	3	13	—	—	—	—	1	1,800	16	3,580	—	N.F.		—	1
						Splint	Do.	—	—	—	—	—	—	—	—	—	—	—	—			
					No. 2	Splint	Do.	—	—	10	432	7½×6½	360	1	510	16	3,800	Fur.	N.F.			
						No. 2, Jewel	Do.	—	—	—	—	—	—	1	800	15	3,500	Fur.	N.F.			
						5 feet	Do.	—	—	8×5	81	7½×6½	81	1	500	20	3,000	Fur.	N.F.			
					Birslie			—	—	—	—	—	—	—	—	—	—	—	—			
					Morrisons Haven.	Great Seam, 7′	S.	12	105	10×8	410	10×5	410	2	1,600	35	27,000	Fan.	F.	21′×6′ 9″.		
Rawyards Coal Co. (Limited).	Rawyards	New Monkland	Lanark	Walter Stirling	No. 1	Wandering Coal	L.	—	—	5	150	7	162	—	—	—	—	—	—		—	1
					No. 2	Virtuewell, 2′ 4″	Do.	8	54	15×5	630	—	—	2	750	16	18,000	—	—	Fan 14′×6′.		
					No. 3	Kiltongue	Do.	3	10	—	—	14×5	726	2	—	16	18,000	Fan.	F.			
					No. 4	Do.	Do.	9	38	11×5	550	—	—	2	1,340	20	20,000	—	F.			
					No. 5	Do.	Do.	5	16	—	—	14×5	518	2	350	20	9,000	Fur.	F.			
					No. 6	Do.	Do.	10	52	14×5⅓	480	—	—	3	—	—	9,000	—	F.			
					No. 7	Do. 3′ 3″	Do.	10	34	—	—	12×5	378	2	1,342	20	20,000	Fan.	F.	Fan 12′×6′.		
Rankine, Patrick	Darngavil and Greyrigg.	Do.	Do.	Peter Brown	No. 10, Darngavil.	Virtuewell, 2′ 7″	Do.	—	—	13×5	139	6×5	126	—	—	—	—	—	—			
					No. 12, do.	Do.	Do.	4	30	8½×5	204	5×5	204	2	300	20	7,100	Fur.	N.F.			
					No. 1, Greyrigg	Do.	Do.	3	40	13⅓×5	96	6×5	120	1	780	20	7,500	Fur.	N.F.			
					No. 2, do.	Do.	Do.	4	35	8⅓×5	96	5×5	96	2	240	20	6,700	Fur.	N.F.			
					No. 4, do.	Do.	Do.	4	18	8⅓×5	158	5×5	158	2	200	20	7,000	Fur.	N.F.			
Redding Colliery Co.	Redding	Polmont	Stirling	Arch. Campbell	No. 4, Gardrum	Hard Coal	Do.	—	18	—	87	—	84	1	500	13	2,800	Fur.	—		—	1
					No. 4	Soft, 2′	Do.	10	46	13×5⅓	164	10×5½	168	2	400	8	2,000	Fur.	N.F.			
					No. 13 Ellrig	Hard, 2′ 6″	Do.	—	23	—	90	—	—	—	—	—	—	—	—			
					No. 13	Soft	Do.	11	50	13×5⅓	168	10×5½	168	2	550	8	3,000	Fur.	N.F.			
					No. 15	Do.	Do.	—	—	7×5	168	10×5½	168	—	—	—	—	—	—			
					No. 16	Hard, 2′ 7″	Do.	—	—	14×5⅓	240	14×5⅓	240	—	—	—	—	—	—			
					No. 16	Soft, 2′	Do.	—	—	14×5¼	300	14×5¼	240	—	—	—	—	—	—			
					No. 17	Hard	Do.	—	31	10×5½	105	10×5½	105	—	—	—	—	—	—			
					No. 17	Soft	Do.	9	35	—	183	—	183	2	550	8	4,300	Fur.	N.F.			
					No. 18	Do.	Do.	7	56	13×5⅓	102	11×5⅓	150	2	450	10	4,000	Fur.	N.F.			
					No. 19	Do.	Do.	7	67	11×5⅓	196	11×5⅓	196	2	550	9	4,500	—	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Robertson, John, & Son.	Ballochnie	New Monkland	Lanark	Jno. Benson	No. 2	Main Coal, 3′ Pyotshaw	S. Do.	4 —	18 —	6×5 —	66 —	10×5 —	70 —	1 —	280 —	36 —	3,000 —	Fur. —	N.F. —			
Do.	Cotton Mill	Do.	Do.	Do.	No. 1	Kiltongue	Do.	9	18	6×5	666	9×5	666	1	800	30	50,000	Fan.	F.	Fan 14′×6′	–	1
Do.	Meadowbank	Do.	Do.	Do.	No. 2	Splint, 3′, Humph.	L.	3	24	10×5	96	10×5	120	1	700	11	2,900	Fur.	N.F.			
Rosslyn, Earl of	Dysart	Dysart	Fife	Jas. McLay	Lady Blanche Randolph Francis	Main Do. Do.	S. Do. Do.	30 7 9	90 — 30	6×4 16×6 16×9	120 456 600	9×6 15×5½ 9×6	198 396 198	1 2 1	2,460 1,600 1,330	36 90 84	12,600 13,000 8,000	Fur. Fur. Nat.	N.F. N.F. N.F.			
Russell, Archd.	Brownlee	Carluke	Lanark	Archd. Kerr	No. 1 No. 2	Ell Main Ell	Do. Do. Do.	6 11 18	18 41 61	17×6 12½×6 17×6	396 516 396	6×3½ — —	420 516 —	1 1 1	746 1,600 2,500	72 54 72	15,860 25,864 —	Fan. — —	F. F. F.	Fan 16′ dia.		
Do.	Clydesdale	Cam'nethan	Do.	Do.	No. 3 No. 4 No. 5 No. 5 No. 5	Main Splint Splint Main Ell	Do. Do. Do. Do. Do.	17 21 5 8 13	44 44 12 23 31	12×5½ — 7×5½ — —	360 — 384 318 384	— 10×5½ 5×5½ — —	— 240 354 318 192	1 1 1 1 1	3,680 1,600 1,800 1,056 900	54 55 55 60 72	23,375 — 4,720 — —	Fan. — St. jet — —	F. F. F. F. F.	Fan 14′×6′	2	1
Do.	Ferniegare	Hamilton	Do.	James Smart	No. 1 No. 2	Ell, 5′ 6″ Main, 3′ 6″ Splint, 6′	Do. Do. Do.	— 37	72 67 42	— 13½×6 —	456 456 528	17×6 — —	384 456 528	– 1 1	— 4,830 3,400	— 45 45	— 24,000 —	— Fan. —	— F. F.	— Fan 16′×6′.	1	–
Do.	Barncluith	Do.	Do.	Arcd. Kerr	No. 1 No. 1 No. 2 No. 2	Ell, 5′ 6″ Main, 3′ 9″ Ell Main	Do. Do. Do. Do.	10 9 12 8	44 38 59 42	13×6 — 13×6 —	414 486 444 516	4×6 — 4×6 —	414 486 444 496	1 1 1 1	3,600 2,508 3,050 1,936	60 54 60 54	16,500 9,000 9,200 7,700	Fan. — Fan. —	F. F. F. F.	Fan 14′×6′ Fan 16′×6′.	–	1
Russell, James, & Son.	Blackbraes	Muiravonside	Stirling	John Smellie	Drumbroider No. 3 No. 12 No. 13	Splint Soft Coal Splint Do., 2′ 2″	L. Do. Do. Do.	— — — —	— — — —	6×5 5×4½ 6×5 6×5	150 281 126 240	5×6 5×4½ 6×5 6×5	150 312 126 240	– – – –	— — — —	— — — —	— — — —	— — — —	— — — —	Stopped.		
Do.	Boghead	Bathgate	Linlithgow	Robt. Christison	No. 6 No. 7 No. 10 No. 15 No. 10 No. 15 No. 18 No. 25	Parrot Ball Coal, 22″ Do. Do. Parrot and Collinburn. Do. Do. Do.	Do. Do. Do. Do. Do. Do. Do. Do.	— 7 16 7 — — 1 2	— 48 94 33 31 30 3 3	11×5 5×5 5×5 5×5 5×5 5×5 4×8 6×5	108 168 144 210 252 312 48 52	5×5 5×5 5×5 5×5 5×5 5×5 5×5 9×5	96 168 144 210 252 234 210 62	– 2 2 1 1 1 1 1	— 760 2,800 1,840 2,850 1,806 820 200	— 31 31 31 31 31 31 31	— 5,680 11,280 2,970 3,720 2,700 270 360	— Fur. Fur. Fur. Fur. Fur. Fur. Nat.	— N.F. N.F. N.F. N.F. N.F. N.F. N.F.	– – –	1	1
Scotland and Auld.	Clarkstone	Beath	Fife	Robt. Muir	Nos. 1 and 2 mines.	Splint, 3′ 7″, 5 feet, 3′ 4″.	Do.	—	—	4×4	—	4×4	—	–	—	—	—	—	—	Abandoned.		
Shotts Iron Co.	Shotts	Shotts	Lanark	J. W. Ormiston	Baton Baton Mine Hartwoodhill Springbank Calderhead Hall Water Engine	Shotts Furnace Virtuewell Shotts Furnace Do. Do. Do. Fire-clay	Do. Do. Do. Do. Do. Do. Do.	9 1 10 6 10 9 3	50 4 50 40 65 31 2	9×5 6×6 9×5½ 9½×5½ 14×5½ 13×5½ 9×4½	90 Mine 78 105 180 198 72	10×5½ 4×4 18×6 10×5½ 5×5½ 4½×4 7×4½	171 66 330 171 180 112 72	1 1 2 1 1 2 1	4,480 1,190 1,550 2,000 3,800 3,800 400	24 34 26 24 27 23 30	14,000 2,000 6,220 5,500 14,000 10,600 3,000	Fur. Fur. Fur. Fur. Fur. Fur. Fur.	N.F. N.F. N.F. N.F. N.F. N.F. N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Shotts Iron Co.	Loanhead	Lasswade	Edinburgh	Jas. Ormiston	Ramsay	Great	S.	31	55	11×6	600	15×5½	650	1	1,250	30	7,700	Fan	N.F.	"Waddle" Fan 15′ dia.		
						South and North	Do.	—	29	8½×6	600	6×3	300	1	880	27	5,680	Fan	N.F.			
					Burghlee	Gas Coal and Ironstone.	L.	24	168	5×5½	615	5½×6	600	2	1,800	30	17,300	—	N.F.			
Do.	Arden	New Monkland	Lanark	Do.	Arden Mine	Virtuewell	Do.	—	—	6×4	—	8×5	66	—	—	—	—	—	—	See Ironstone Mines.		
Do.	Brownieside	Do.	Do.	Do.	Brownieside	Drumgray	Do.	—	—	15×6½	468	3×6½	498	—	—	—	—	—	—			
Do.	Castlehill	Carluke	Do.	Do.	No. 4	Main Coal	S.	7	44	14×5½	183	12×5	170	1	2,360	36	23,350	Fur.	N.F.			
					No. 8	Do.		—	—	10×5½	171	5×5	102	—	—	—	—	—	—			
Do.	Morningside	Cam'nethan	Do.	Do.	No. 1	Main & Pyotshaw		—	—	13×5	108	4×5	138	—	—	—	—	—	—		—	2
					No. 5	Ell, Pyotshaw, and Main.		—	—	15½×6½	252	4½×5	277	—	—	—	—	—	—			
					No. 7	Virtuewell, Lower Drumgray.	L.	8	67	13×5½	483	3½×5½	483	3	780	35	10,120	Fur.	F.			
					No. 9	Splint, 4′ 3″	S.	5	49	15½×6½	336	4½×6½	336	1	1,144	50	7,250	Fur.	F.			
					No. 10	Lower Drumgray	L.	10	63	12½×5½	550	3½×5½	550	2	650	32	11,160	Fur.	F.			
Do.	Polkemmet	Whitburn	Linlithgow	Robt. Jamieson	No. 4	Rough and Ball	Do.	—	—	9×5½	228	6×5½	228	—	—	—	—	—	—	See Ironstone Mines.		
					No. 5	Ball, Gas Coal	Do.	—	—	9×5½	78	6×5½	88	—	—	—	—	—	—			
					No. 9	Gas Coal, 9″	Do.	—	—	7×5	228	5×5	132	—	—	—	—	—	—			
Do.	Harthill	Do.	Do.	Do.	No. 3	Main, 2′ 6″, Ball, 23″	Do.	—	—	7×5	186	5×5½	108	—	—	—	—	—	—			
					No. 4	Gas Coal	Do.	—	—	9×5	180	—	—	—	—	—	—	—	—			
Simpson, A. G.	Carfin	Bothwell	Lanark	J. F. Langlands	No. 1	Pyotshaw	Do.	—	12	—	90	—	—	1	400	25	1,500	—	N.F.			
						Main Coal, 4′	Do.	6	14	13×6	120	—	—	1	500	20	2,000	—	F.			
					No. 2	Virtuewell, 2′	Do.	—	30	—	420	—	—	2	480	16	5,000	—	F.			
					No. 3	Do.	Do.	4	50	—	—	11×5	390	1	600	16	—	Fur.	F.			
						Ell Coal		—	—	—	174	13×5	190	—	—	—	—	Fur.	F.			
						Pyotshaw, 2′ 6″		—	—	—	360	13×5	340	—	—	—	—	—	—			
Do.	Bidallan	Shotts	Do.	Do.	No. 1	Crofthead	Do.	7	16	8×5½	258	5×5½	258	1	33	20	2,500	—	F.			
Simpson, James	Springwells	New Monkland	Do.	James Simpson	No. 1	Kiltongue	Do.	—	—	12×5	360	—	—	1	300	12	12,000	Fan	F.	Fan 10′ dia.		
					No. 2	Do., 4′ 5″	Do.	9	39	—	—	12×5	360	1	1,000	12	—	—	F.			
					No. 3	Do.	Do.	11	83	13×5	360	—	—	2								
Simpson, Wilson, & Co.	Legbrannock	Bothwell	Do.	John Wilson	No. 1	Virtuewell, 2′ 8″	Do.	4	41	12×5	183	4½×5	66	1	1,000	25	2,400	Fur.	F.		—	1
Smith, Alexander	Skellyton	Dalserf	Do.	Alex. Smith	Skellyton	Splint	S.	—	—	13×5½	120	11×5½	50	—	—	—	—	—	—	Abandoned.		
Smith, James, and Son.	Hill	Do.	Do.	James Boyd	No. 1, Hill	Main	Do.	—	—	11×5½	175	15×6	156	—	—	—	—	—	—		1	—
					No. 2, Do.	Do., 4′	Do.	8	50	11×5½	175	15×6	156	1	1,300	42	9,820	Fur.	F.			
Smith, Wm.	Nettlehole	New Monkland	Do.	Jas. Colquhon	No. 2	Drumgray	L.	4	13	7×5	132	6½×5	102	1	190	15	1,000	Nat.	N.F.			
Spencer, Andrew	Auldton	Dalserf	Do.	And. Hunter	No. 1	Splint, 4′ 6″	S.	6	63	21×6	552	—	438	1	2,500	40	8,300	Fan	F.		—	1
					No. 1	Main, 4′	Do.	3	29	—	438	—	438	1	2,970	40	7,000	—	F.	Fan 14′6″ dia. × 6′		
					No. 2	Ell, 5′ 6″	Do.	4	25	—	360	10×6	380	1	870	30	6,000	—	F.			
Do.	Ashgill	Do.	Do.	Do.	No. 3	Ell	Do.	—	—	—	360	16×6	360	—	—	—	—	—	—			
						Main	Do.	—	—	—	552	—	438	—	—	—	—	—	—		—	1
					No. 4	Ell	Do.	7	38	14×6	138	5½×5½	69	1	1,160	20	11,400	Fan	F.	Fan 17′ × 6′.		

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Spowart, Thos., & Co.	Elgin & Wellwood	Dunfermline	Fife	James Russell	Wellwood	8 feet, 4′	L.	10	40	10×5	90	12×5	120	1	158	12	2,400	Fur.	N.F.		—	1
					Balmule	Part of 8 feet 3′ 1″	Do.	—	—	—	—	10×5	180	-	—	—	—	—	—			
					Union	5 feet and Splint	Do.	—	—	10×5	300	9×4½	142	-	—	—	—	—	—			
					Victoria	8 feet, Swallow drum	Do.	—	—	8×4	114	10×4½	196	-	—	—	—	—	—			
					Prince of Wales	Splint, 4′ 8″, 5 feet	Do.	25	75	12×5	405	10×4½	252	2	1,500	12	5,250	Fan	N.F.	Fan 16′×5′. From 40 to 60 rev. per minute, at Albert Pit.		
					Colton	7 feet	Do.	8	15	10×5	300	—	—	1	1,320	12	2,500	Fan	N.F.			
					Elgin	5 feet, Splint	Do.	35	128	12×6	450	5×3	240	2	600	16	7,000	Fur.	N.F.			
					Wallsend	5 feet, Splint	Do.	8	22	12×5	378	12×5	318	2	1,680	12	3,600	Fan	N.F.			
					Drumtuthill	5 feet, 8 feet	Do.	—	—	14×6	390	5×5	90	-	—	—	—	—	—			
					Lochend	8 feet	Do.	—	—	10×5	240	5×3	240	-	—	—	—	—	—			
					Derby	5 feet, Splint	Do.	4	13	11×6½	300	7×6½	300	1	200	16	3,600	St. jet	N.F.			
Springbank Coal Co.	Springbank	Shotts	Lanark	R. Tennant	No. 2	Lower Drumgray	Do.	3	14	10½×5	120	12×5	150	1	1,300	20	5,000	St. jet	N.F.			
					No. 3	Do.	Do.	16	75	14×5	300	8×5	270	2	700	30	5,000	Fur.	F.			
Stand Coal Co.	Stand	New Monkland	Do.	Alex. Blackadder	No. 3	Virtuewell	Do.	7	40	5×5½	198	7×5½	198	1	800	28	4,380	Fur.	N.F.			
					No. 5	Do.	Do.	3	8	7×5½	75	5½×5½	75	1	70	38	960	—	N.F.			
Summerlee Iron Co.	Dykehead	Hamilton	Do.	William Wilson	No. 1 Mine	Ell, 5′ 6″, Main, 5′ 2″, and Splint, 5′ 11″.	S.	38	185	15×5 10×5	105 Mine	22×5½	231	4	1,770	60	29,528	Fan	F.	"Guibal" fan, 16½ ft. diar.	1	—
Do.	Shieldmuir	Dalzell	Do.	Do.	No. 2	Splint	Do.	16	109	8×5½	315	7×5	288	2	1,340	24	8,970	Fur.	F.		—	1
Do.	Stepends	Shotts	Do.	Alex. Faulds	No. 5	Drumgray	L.	3	19	8½×5	186	8½×5	226	1	1,263	15	3,600	Fur.	N.F.		—	1
					No. 6			7	11	12½×5½	—	5½×5½	—	-	—	—	—	—	—	Sinking.		
Do.	Dunsyston	Do.	Do.	Do.	No. 2	Do.	Do.	6	13	12½×5½	268	3½×5½	268	2	642	16	8,140	Fur.	F.			
					No. 3			3	5	12×6½	—	—	—	-	—	—	—	—	—	Sinking.		
Sutherland, Duke of.	Brora	Clyne	Sutherland	John Crowe	Faskally	Brora	S.	7	13	8	270	8	196	2	400	16	2,500	Fur.	F.			
Swann, James	Glespin	Douglas	Lanark	Wm. Walker	No. 1	9 feet	Do.	16	51	14½×5½	330	12×5½	282	2	2,000	50	25,300	Fan	N.F.	Fan 17 ×7′	—	1
					No. 3	Elanora	Do.	2	10	13×5½	180	8×5	90	1	3,000	50	3,600	Fur.	N.F.			
					No. 4	Big Drum	Do.	4	9	4½×4½	282	4½×4½	282	1	476	20	1,900	Steam	N.F.			
					No. 5	Do. and Robb	Do.	2	12	12×6	510	9×4½	132	1	500	40	2,500	Fur.	N.F.			
Do.	Rigside	Do.	Do.	Do.	No. 2	Gas, 22″	L.	7	14	14×5½	280	6×5½	280	1	850	30	12,000	—	—			
Sym, James	Marlage	Dalserf	Do.	Wm. Sym	No. 2	Splint	Do.	6	16	12×5	129	9×5½	125	1	650	32	6,000	Fur.	N.F.			
Snowdowne, Jas.	Middleton	Muckhart	Perth	H. Stewart		Cherry	L.	—	—	6×5	Mine	8×5	60	-	—	—	—	—	—	Standing.		
Steelend Coal Co.	Steelend, North	Saline	Fife	Robt. Crombie	Steelend	Smithy	Do.	—	—	11×4½	102	7×4½	24	-	—	—	—	—	—	Stopped.		
Snowdowne, R.	Dollar	Dollar	Clackmannan	Robt. Snowdowne.				—	—	—	—	—	—	-	—	—	—	—	—	Stopped.		
Thornton, Jas.	Stravenhouse	Carluke	Lanark	Robt. Barbour	No. 1	Ell Coal, 6′ Main, Splint.	S.	15	65	18×6	510	16×6	492	3	660	36	36,000	Fan	F.	Fan 17′, dia. ×7′	—	1
					No. 2	Do.	Do.	5	27	—	—	—	—	-	—	—	—	—	F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.									
															yards.	feet.						
Thornton, Thos.	Fauldhouse	Whitburn	Linlithgow	Thos. Thornton	No. 1	Shotts Furnace	L.	4	50	7×5	138	5×5	138	1	690	16	5,800	Fur.	N.F.			
					No. 2	Do., 2′ 3″	Do.	—	—	4×6	26	10×6	66	—	—	—	—	—	—			
Do.	Stonehead	Do.	Do.	Do.	Stonehead	Mill Coal	Do.	3	20	9½×5	198	3½×5	223	2	658	18	7,200	Fur.	N.F.			
Do.	Auchinheath	Lesmahagow	Lanark	Jno. Wardrop	Old Hall	Lesmahagow "Wee" and Main Cannel.	Do.	15	120	6×4½ 9½×4	Mine 132	5×4	54	1	1,920	27	4,500	Fur.	N.F.	(Double shift.)	—	1
Thrashbush Coal Co.	Thrashbush	New Monkland	Do.	Henry Love	No. 1	Virtuewell	Do.	8	18	7×5	288	5×5	288	1	560	12½	6,600	Fan	F.	Fan 8′ × 4′	—	1
					No. 1	Kiltongue	Do.	—	26	—	—	—	—	1	512	20	7,400	—	F.			
					No. 2	Virtuewell	Do.	16	24	7×5	—	—	—	2	350	14	13,500	Fan.	F.	Fan 14′ × 5′.		
					No. 2	Kiltongue	Do.	—	36	—	480	5×5	480	2	310	22	17,500	—	F.			
Do.	Ponfeigh	Douglas	Do.	John Spence	No. 1	Rob, 5′ 2″	S.	8	17	12×5	138	6×5	69	1	400	18	2,500	Fur.	N.F.	Stopped.		
					Nos. 1 and 2	Do. Back, 4′ 6″	Do.	—	—	—	—	4×4	12	—	—	—	—	—	—			
					Nos. 3 and 4	Collypath, 3′ 9″	Do.	—	—	—	—	—	—	—	—	—	—	—	—			
					No. 5 Mine	- - -	-	—	—	—	—	5×4½	90	-	—	—	—	—	—			
Townhill Coal Co.	Townhill	Dunfermline	Fife	Jas. Wyllie	No. 5	Eight feet, 7′	L.	—	—	10×5	78	10×5	270	-	—	—	—	—	—	- - -	—	2
					No. 6	Five feet	Do.	5	33	12×5	372	—	—	1	1,000	25	7,000	Fur.	N.F.			
					No. 6	Splint	Do.	7	45	—	—	10×5	270	1	1,000	25	7,000	Fur.	N.F.			
					Day Mine	Four feet, 4′ 4″	Do.	—	—	—	—	5×5	—	-	—	—	—	—	—			
					No. 7	Eight feet	Do.	12	83	12×5	276	—	—	2	900	30	16,000	Fur.	N.F.			
					No. 8	Do.	Do.	3	17	10×5	246	10×5	78	1	600	20	6,000	Fur.	N.F.			
					Donald	Five feet, Splint	Do.	15	88	12×5	360	17×9	516	4	460	30	18,000	Fur.	N.F.			
Torrance, Wm.	Trees	Bathgate	Linlithgow	Wm. Torrance	No. 1	Main, 3′ 6″	S.	—	—	—	—	—	—	-	—	—	—	—	—	Stopped.		
					No. 2	Ball, 2′	L.	4	15	7×5	252	5×5	267	1	330	16	4,500	Nat.	N.F.			
Uphall Oil Co. (Limited).	Wester Barbauchlaw.	Do.	Do.	Wm. Fraser	No. 2	Main Coal	S.	2	15	14×5	240	4×4	220	2	200	30	5,440	Fur.	N.F.			
					No. 9	Do., 3′ 6″	Do.	3	24	10×6	249	3×6	270	1	1,200	20	6,000	Fur.	N.F.			
Ure, Robt.	Dykehead	Hamilton	Lanark	- - -	No. 1	Splint	Do.	3	10	7×4½	126	5×4½	138	2	632	16	6,800	Fur.	N.F.			
Vogrie Coal Co.	Vogrie	Temple	Edinburgh	Jno. B. Johnstone	No. 1	Splint, 4′ 6″	Do.	9	45	5×5	360	5×5	370	1	1,620	32	5,200	Fur.	N.F.	- - -	—	2
Waddell, Alex.	Drumbowie	New Monkland	Lanark	Alex. Waddell	No. 1	Upper Drumgray	L.	6	28	5×5	90	6×5	101	-	—	—	—	—	—			
Waddell & Son	Mauldslie	Carluke	Do.	Thos. Anderson	No. 1	Ell, 7′	S.	—	—	—	—	—	—	-	—	—	—	—	—			
					No. 2	Main, 5′ 6″	Do.	17	117	12×5½	420	5½×5	460	3	760	66	37,500	Fur.	F.	- - -	—	3
						Splint, 5′	Do.	—	—	—	—	—	—	-	—	—	—	—	—			
Waldie, James, and Sons.	Tranent	Tranent	Haddington	H. Stewart	Ormiston Road	Splint	Do.	—	—	9×5	78	—	—	-	—	—	—	—	—			
					Carlaverock	Do. 4′ 4″	Do.	12	35	8	207	8	209	1	1,000	20	2,000	Fur.	N.F.			
					Kingslaw No. 1	Do.	Do.	3	10	10½×5½	114	13½×5½	132	1	100	20	1,500	Nat.	N.F.			
Walker, Henry, & Son.	Balbardie	Bathgate	Linlithgow	Wm. Swann	No. 1	Balbardie, 4′ 1″	Do.	3	3	—	—	12×5	168	-	—	—	—	—	—	Downcast is a mine dipping 1 in 4.	—	2
					Mine	Do.	Do.	9	63	12×5½	2,198	—	—	1	3,290	24	18,000	Fur.	N.F.			
					No. 3 Inchhog	Do.	Do.	4	4	15×4	90	5×5	78	1	60	60	800	Nat.	N.F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Wallace, A.	Kingseat	Dunfermline	Fife	A. Crookston	No. 1	5 Feet and Splint	L.	23	154	13×5	456	—	—	1	3,100	16	7,065	—	N.F.		—	4
					Henderson	Splint, 4 feet and 8 feet, 3′ 8″.	Do.	23	126	—	—	8½×8	339	2	2,266	16	10,000	Fur.	N.F.			
					No. 3	Splint, 5 feet	Do.	17	109	8½×8	660	—	537	2	2,083	16	6,651	—	N.F.			
Watson, John	Earnock	Hamilton	Lanark	Jas. Gilchrist	No. 1	Ell	S.	5	18	22×6′10″	792	—	—	1	50	42	9,000	St. jet	F.	Fan erecting.		
					No. 2	Do.	Do.	5	18	11′ 8″× 7′ 10″	796	9′1″×7′10″	826	1	—	—	12,000	—	F.			
Do.	Balquhatstone	Slamannan	Stirling	Thos. Thomson	No. 4	Coxrod and Splint	L.	5	42	8×5	254	4×5	254	2	600	14	8,200	Fur & S. jet	N.F.	—	1	—
					No. 5	Do., 2′ do.	Do.	7	66	7×5½	290	5×5½	290	2	780	24	11,500		N.F.			
					No. 7	Do. do.	Do.	6	72	8×5½	280	5×5½	280	2	780	14	12,100	Fur.	N.F.			
Do.	Lodge	Do.	Do.	Do.	No. 1	Do., do.	Do.	5	66	12×5	390	4×5	390	2	1,500	14	11,500	Fur.	N.F.	—	1	—
					No. 2	Do., do.	Do.	5	68	5½×8	396	5½×5	396	3	600	20	15,400	Fur.	N.F.			
					No. 3	Do., 2′ 3″ do., 2′	Do.	7	80	12×5½	219	5½×3	219	2	525	20	13,000	Fur.	N.F.			
Do.	Parkhead	Dalzel	Lanark	Wm. Waugh	No. 1	Ell, 6′	S.	10	45	13×5½	363	10×6	370	2	200	30	21,000	Fur.	F.	—	—	5
					Lady Emily or No. 2.	Do., Splint	Do.	22	128	12½×6	528	10×6	546	1	2,100	36	12,000	Fur.	F.	Double Shift.		
Do.	Motherwell	Hamilton	Do.	Do.	No. 1	Ell	Do.	10	36	14½×6	300	6×6	420	1	100	30	10,000	Fur.	F.	—	—	2
					No. 2	Do., Splint	Do.	16	89	14×6	480	—	—	1	2,350	38	—	—	F.			
					Watsonville	Do., Main	Do.	15	74	14×6	460	—	—	1	1,600	36	7,500	Fur.	F.			
					No. 4. Palace	Do. do.	Do.	13	89	14×6	420	7×6	420	2	900	40	29,000	Fan	F.	Fan 20′×8′.		
Watt, James	South Arnloss	Slamannan	Stirling	Wm. Wilkie	No. 1	Coxrod	L.	6	39	8½×5	150	5½×5	150	1	2,200	9	8,060	Fur.	N.F.			
					No. 2	Splint	Do.	4	22	7×5	90	7×5	90	1	1,200	9	5,200	Fur.	N.F.			
Wemyss, James Hay E. (Trustees of late).	Wemyss	Wemyss	Fife	Wm. Carey	Victoria	Bowhouse	Do.	72	239	21½×5½	312	—	—	2	2,893	25	22,954	Fur.	N.F.			
					Lady	Brankstoue	—			—	—	14×5	432	—	—	—	—	—	—			
					Hugo	Parrot, Wood	Do.			9×5½	299	5×5½	299	2	1,825	30	16,796	Fur.	N.F.			
West Calder Oil Co. (Limited).	Woolfords	West Calder	Edinburgh	John Weir	No. 1	Hurlett	Do.	—	—	11×5½	144	6½×6½	90	—	—	—	—	—	—	Stopped.		
West Glentore Coal Co. (Limited)	West Glentore	New Monkland	Lanark	Jno. Danskin	No. 1	Kiltongue	Do.	8	41	7×5	120	5½×5	127	2	800	7	2,187	Fur.	N.F.			
					No. 5	Virtuewell	Do.	4	15	8×5	48	3×5	60	1	400	9	1,200	Nat.	N.F.			
					No. 6	Kiltongue	Do.	4	25	8×5	90	5×5	97	1	880	5	1,620	Nat.	N.F.			
Do.	—	—	—	—	No. 7	Drumgray	Do.	2	2	8×5½	120	5×5½	120	—	—	—	—	Fur.	F.	Newly opened	—	1
West of Fife Coal Co.	Muircockhall	Dunfermline	Fife	Henry Ness	No. 1	Splint, 5 feet	Do.	25	140	—	—	17½×6	552	2	858	34	17,500	Fur.	N.F.	—	—	2
					No. 2	8 feet, 6 feet, 3 feet	Do.	—	—	13½×6	612	—	—	—	—	—	—	—	—			
Weir, A. & W.	Eastertown	New Monkland	Lanark	Robt. Weir	No. 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
					No. 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
White, Elizabeth	Ormiston Hall	Ormiston	Haddington	Andrew White	No. 2	Splint and rough	Do.	3	36	11×5	120	11×5	84	1	500	12	3,600	Fur.	N.F.			
Wilson, W. & J.	Standrig	Muiravonside	Stirling	—	Brothers	Coxrod	Do.	6	18	12×5	288	12	240	1	1,000	16	1,900	Fur.	N.F.			
Wilson, John	Bantaskine & Zetland.	Polmont	Do.	—	Greenwells	Coxrod	Do.	3	18	9×3	87	3×3	62	1	660	18	1,100	Fur.	N.F.			
Wilson, John	Overtown	Cam'nethan	Lanark	Henry Telfer	No. 2	Splint, 4′, Ell	S.	17	40	5½×6	372	5½×6	372	4	980	16	19,000	Fur.	F.			
					No. 3	Ell, 9′	Do.	15	64	14×5½	504	—	—	1	3,550	25	13,000	Fur.	F.			
					No. 3	Main 4′	Do.			—	—	4×5½	576	1	950	25	7,000	Fur.	F.			

List of Coal Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Wilson, John	Law	Carluke	Lanark	Henry Telfer	No. 1	Ell	S.	7	65	—	—	—	216	—	—	—	—	—	—			
					No. 1	Main, 4′ 4″	Do.			7½×5	312	6×5	312	1	1,000	20	8,000	St. jet	F.			
					No. 1	Splint, 7′	Do.			—	436	6×5	436	1	1,540	25	12,000	—	F.			
					No. 2	Ell, Main, and Virtuewell	Do.	5	37	14×6	285	4½×6	285	3	800	33	20,000	Fan	F.	Fan 12′ diam. 50 revol. per min.		
										—	380	—	380	—	—	—	—	—	F.			
					No. 3	Virtuewell	L.	—	—	8×5	180	11×6	42	—	—	—	—	—	—			
Do.	Shawfield	Do.	Do.	Do.	No. 1	Ell	S.	22	135	11×6	372	3½×6	372	2	2,300	40	14,000	Fur.	F.			
						Main	Do.			—	468	—	468	2	2,500	40	13,500	Fur.	F.			
Do.	Douglas Park	Bothwell	Do.	Do.	Nos. 1 and 2	—	—	12	27	22×6	792	16×6	762	—	—	—	—	—	—	Sinking	—	1
Wilson, George, & Co.	Kinneil	Bo'ness	Linlithgow	William White	No. 1 or Mingle	Parrot, 3′	L.	—	—	8×5	396	5×4	342	—	—	—	—	—	—			
					No. 2 Snab	Splint, 3′, 6 feet	Do.	3	19	14×5½	564	9×5½	444	1	2,880	16	6,125	Fur.	F.			
					No. 2, or Burn	Red Coal	Do.	—	—	8×5	300	5×4	270	—	—	—	—	—	—			
					No. 13	Splint	Do.	—	—	14×5½	330	5×4	180	—	—	—	—	—	—			
					Schoolyard	Parrot	Do.	12	32	6×6	438	9×5	438	1	1,065	16	3,700	Fur.	F.			
					Do.	Foul Coal	Do.	—	—	8×7½	438	8½×7½	432	—	—	—	—	—	—			
					No. 18, Lothians	Smithy, 3′	Do.	10	30	14×6	504	12×5	366	1	1,566	16	9,300	Fur.	F.	Chance and Burn Pits also upcasts for this.		
					No. 18, do.	Main	Do.	—	—	18×5½	510	8½×7½	432	—	—	—	—	—	—			
					No. 21, Chance	Smithy	Do.	—	—	14×6	504	10×5	360	—	—	—	—	—	—			
Wishaw Coal Co.	Dalzell	Dalzell	Lanark	Thos. Gibb	Broomside	Ell, 5′ 10″	S.	16	70	5×6	120	6×6	300	1	1,000	27½	18,000	Fur.	F.			
						Main, 4′	Do.	—	—	14×6	372	—	372	1	2,610	22	17,000	Fur.	F.			
Wishaw Estate	Woodmuir	Westcalder	Edinburgh	Alex. McD. Thomson.	No. 2	Wilsontown Main	Do.	12	25	12½×5½	270	10×5½	240	2	1,660	30	15,000	Fur.	N.F.			
Wood, James	Barbauchlaw	Bathgate	Linlithgow	Arch. Robertson	Moss	Gas	L.	3	17	8½×5½	92	5½×1½	92	1	350	12	8,100	Fan.	N.F.	Fan 10′×4′.		
					No. 12	Main, Ball	Do.	6	47	12×5½	240	16×5½	252	2	631	18	10,800	Fan.	N.F.	Fan 4½′ "Schiele."		
					No. 13	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Do.	Bathville	Do.	Do.	Do.	No. 1	Main Coal	Do.	6	66	—	—	10½×5½	192	2	715	20	17,000	Fan.	N.F.	Fan 16′×6′	1	4
					No. 3	Do., 3′ 5″	Do.	7	55	8×5½	222	—	—	2	1,040	15	10,500	—	N.F.			
					No. 4	Ball Gas	Do.	6	30	13×5½	292	—	—	2	950	18	10,500	—	N.F.			
					No. 5	Main Coal	Do.	—	—	11×5½	222	—	—	—	—	—	—	—	N.F.			
					No. 9	Upper Cannel	S.	—	—	—	—	13×5½	58	—	—	—	—	—	N.F.			
					No. 10	Do.	Do.	—	—	—	—	—	—	—	—	—	—	—	N.F.			
					No. 11	Do., Coxrod	L.	4	14	10×5½	68	5½×3	68	1	480	18	3,825	Steam	N.F.			
Do.	Shieldmuir	Dalzell	Lanark	Thos. Crookston	No. 1	Main and Splint	S.	20	76	13½×5½	576	6×3½	458	2	1,850	22	13,000	Fur.	F.	—	—	2
Wyper, P. & R.	Cleland Townhead	Bothwell	Do.	P. Wyper	No. 1	Ell Coal	S.	—	—	7½×5½	145	5×5½	145	—	—	—	—	—	—			
					No. 2	Virtuewell	L.	—	—	—	—	8×5	270	—	—	—	—	—	—			
					No. 4	Splint	S.	2	11	12×5½	96	—	—	1	300	48	1,200	Fur.	N.F.			
Williams, John, & Co.	Camp	Dalzell	Do.	Michael Ross	No. 1	Splint, 4′ 10″	Do.	13	60	15×5½	564	—	—	2	2,550	20	20,000	Fan.	F.	18′ × 7′.		
					No. 2	Splint, Main, 3′ 5″, Pyotshaw, 3′ 7″.	L.	3	12	—	—	15×6	438	—	—	—	—	—	—			
Ycoll. A. Graham	Kelly & Balcorma	Carnbee	Fife	—	Kelly	Kelly Coal	Do.	—	—	10×4½	216	10	126	—	—	—	—	—	—	Standing.		
					Kilrenny	Pitcorthie	Do.	—	—	10×4½	—	5×4½	18	—	—	—	—	—	—			
Young, Robt.	Greenhill	Shotts	Lanark	Jno. McDonald	No. 7	Drumgray	Do.	—	—	7×5	279	5×5	279	—	—	—	—	—	—			
					No. 8	Virtuewell	Do.	—	—	8×5	210	5×5	180	—	—	—	—	—	—			
					No. 9	Do.	Do.	11	80	8×5	342	5×5	342	3	1,330	30	8,400	Fur	N.F			
					No. 10	Drumgray	Do.	5	18	7×5	378	5×5	378	2	390	30	3,600	Fur.	N.F.			
					No. 11	Do.	Do.	—	—	6½×5	108	4×5	108	—	—	—	—	—	—			

List of Coal Mines, with the mode of Working, Ventilation, &c., during the year 1878—*continued.*

Name of Owner.	Name of Colliery.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
		Parish.	County.					Above Ground.	Below Ground.	Downcast. Size in Feet.	Downcast. Depth in Feet.	Upcast. Size in Feet.	Upcast. Depth in Feet.									
Young's Paraffin Light and Mineral Oil Co., Limited.	Addiewell - -	West Calder -	Edinburgh -	Thos. Prentice -	No. 15, Baads	Housto	L. -	—	—	—	—	—	—	-	yards. —	feet. —	—	—	—	Stopped.		
					No. 16, Muirhall	Hurlet	Do. -	—	—	15×6	312	5×5	120	-	—	—	—	—	—			
					No. 18, do.	Houston 5′ 4″	Do. -	—	—	5×5	180	12×5	60	-	—	—	—	—	—			
					No. 19, do.	Hurlet	Do. -	—	—	15×	312	12×6	120	-	—	—	—	—	—			
Young, Jno., & Co.	West Drumgray -	New Monkland -	Lanark -	Robt. Young -	No. 1 - -	Virtuewell - -	Do. -	—	—	13×5½	150	—	—	-	—	—	—	—	—			
					No. 2 - -	Do. - -	Do. -	6	30	6×5	108	6×5	108	1	400	20	4,500	Fur.	F.			

List of Ironstone Mines, with the Mode of Working, Ventilation, &c., during the Year 1878.

Name of Owner.	Name of Mine.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
		Parish.	County.					Above Ground.	Below Ground.	Downcast. Size in Feet.	Downcast. Depth in Feet.	Upcast. Size in Feet.	Upcast. Depth in Feet.									
Addie, Robt., & Sons	West Benhar -	Shotts - -	Lanark -	Jas. Gray -	No. 1 - -	Slaty band, 11″ -	L. -	26	159	—	—	16×6	696	3	yards. 1,672	feet. 20	32,061	Fur.	N.F.	- - -	—	3
					No. 2 - -	Do. - -	Do. -	—	—	10×6	660	—	—	-	—	29	—	Fur.	N.F.			
					No. 3 - -	Do. -	Do. -	20	126	16×6	696	—	—	2	1,628	20	21,261	Fur.	N.F.			
Do. -	Callander -	Falkirk - -	Stirling -	R. Allan -	No. 1, Loanfoot	Do. -	Do. -	12	49	8×5	138	14×5	138	1	300	24	4,000	Fur.	N.F.			
Baird, Wm., & Co.	Stand - -	New Monkland -	Lanark -	- - -	No. 4 - -	Blackband, 12″ -	Do. -	8	33	6½×5	144	6½×5	144	1	1,200	12	5,000	Fur.	F.			
Barr and Higgins	Langbyres -	Shotts - -	Do. -	Thos. Lithgow -	No. 2 - -	Bellside - -	Do. -	5	32	13×5	192	14×5½	270	2	560	8	4,990	Fur.	F.			
Do. - -	Bowhousebog -	Do. - -	Do. -	Do. -	No. 2 - -	Slaty band -	Do. -	—	—	8×5	30	10×5	48	-	—	—	—	—	—	Not working.		
Black, W. & Sons	Stanrigg - -	New Monkland -	Do. -	Jas. Prentice -	No. 1 - -	Slaty band, 1′ 5″ -	Do. -	10	30	—	—	10×6	885	2	133	30	5,200	St. jet	F.			
					No. 2 - -	- - -	- -	—	—	11×5½	882	—	—	-	—	—	—	—	—			
Carron Co. - -	Valleyfield -	Torryburn - -	Fife - -	Alex. Clelland -	No. 1 - -	- - -	Do. -	29	76	15×5	540	14×6	540	1	1,166	10	6,000	Steam	F.			
Do. -	Blairhall - -	Culross - -	Perth - -	Do. -	No. 2 - -	- - -	Do. -	26	91	9×6	498	8×6	498	3	1,156	12	7,300	Fur.	F.	- - -	—	1
Do. - -	Drumshangie -	New Monkland -	Lanark -	Do. -	No. 1 - -	Airdrie Black band	Do. -	—	—	13×5	102	13×5	84	-	—	—	—	—	—	Not working.		
					No. 3 - -	Do. - -	Do. -	—	—	12×5	102	8×6	45	-	—	—	—	—	—			
Coltness Iron Co. -	Braidwood -	Carluke - -	Do. -	Robt. Watt -	No. 1, Mayfield	3, 5, and 7 feet -	Do. -	15	85	19×5½	276	12×5	120	1	2,036	30	10,428	Fur.	N.F.	Fur. above ground,		
					No. 2, do.	Do. - -	Do. -	—	—	14×6	407	6×3½	407	-	—	—	—	Fan	N.F.	Fan 17′×6′.		
					Wilton - -	Do. - -	Do. -	15	74	18×5½	240	10×5	168	2	2,405	30	7,756	Fur.	N.F.	Do. do.		
								—	—	—	—	10×5	108	-	—	—	—	Fur.	N.F.			
Do. - -	Hallcraig - -	Do. - -	Do. -	Do. - -	Hallcraig -	5 and 7 feet -	Do. -	21	68	16×6	264	6×3	306	2	1,429	25	14,236	Fur.	N.F.			
Do. - -	Crofthead - -	Shotts - -	Do. -	Robt. Dewar -	Harthill -	Slaty band, 11″ -	Do. -	24	173	21×7	789	7×4	834	3	1,682	28	24,000	Fur.	F.	-	—	1
Do. -	Polkemmet -	Whitburn -	Linlithgow -	Do. -	Polkemmet -	Do. -	Do. -	18	202	21×7	756	7×4	786	4	1,560	24	24,000	Fur.	F.	- - -	—	2

List of Ironstone Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Mine.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Workg.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
		Parish.	County.					Above Ground.	Below Ground.	Downcast. Size in Feet.	Downcast. Depth in Feet.	Upcast. Size in Feet.	Upcast. Depth in Feet.		yards.	feet.						
Coltness Iron Co.	Muirhead - -	Shotts - -	Lanark -	Robert Dewar -	Muirhead No. 1	Slaty band -	L. -	12	68	21×7	684	7×5	696	1	1,980	24	18,000	Fur.	F	Sinking.		
					No. 2	- - -	- -	—	—	—	—	—	—	—	—	—	—	—	—			
Do. - -	Salisburgh - -	Do. - -	Do. -	- - -	Duntilland No. 1	Goodockhill -	Do. -	6	37	11×6	388	6×5	404	1	1,050	24	10,500	Fur.	N.F.	- - -	1	
					Do. No. 2	Do. - -	Do. -	7	28	13×6	376	6×5	402	1	1,290	20	9,400	Fur.	N.F.			
					Drumbowie No. 1	Do. - -	Do. -	8	64	11×6	315	6×5	329	1	2,378	18	10,840	Fur.	N.F.			
					Mountcow -	Do. - -	Do. -	1	1	11×6	324	6×5	341	2	1,280	28	5,480	Fur.	N.F.			
Do. - -	Muldron - -	West Calder -	Edinburgh -	Geo. McCulloch	No. 6 - -	Curleyband -	Do. -	—	—	11×5½	72	4×5½	94	-	—	—	—	—	—	Standing.		
					No. 8 - -	Do. - -	Do. -	2	—	12×5½	84	5½×3½	122	-	—	—	—	—	—			
					No. 9 - -	Do. - -	Do. -	1	—	12×5½	108	5½×3½	146	-	—	—	—	—	—			
Do. - -	Woodend - -	Torphichen - -	Linlithgow -	Jno. Stevenson -	No. 2 - -	Black band -	Do. -	—	—	9×5	303	5×5	321	-	—	—	—	—	—	(*See* Coal Mines.)		
					No. 5 - -	Clay band -	Do. -	—	—	12×6	228	6½×6	246	-	—	—	—	—	—			
						Black band -	Do. -	—	—	12×6	330	6½×6	348	-	—	—	—	—	—			
Dixon, William, (Limited).	Fauldhouse -	Whitburn -	Linlithgow -	Thos. Nimmo -	No. 8 - -	Slatey band -	Do. -	—	—	15½×7	750	7×6½	750	-	—	—	—	—	—	- - -	1	1
					No. 9 - -	Do. 11″ -	Do. -	13	96	8½×6½	720	6½×6½	720	4	1,450	24	19,200	Fur.	N.F.			
					No. 13 - -	Do. -	Do. -	20	188	21½×8	600	7×6	600	3	960	24	23,470	Fur.	F.			
Dunlop, Colin, & Co.	Auchlochan -	Lesmahagow -	Lanark -	John Sloss -	No. 4 - -	Black band, 8″ -	Do. -	10	52	5×5	87	6×5½	108	2	560	24	12,600	Fur.	F.			
Do. -	Quarter - -	Hamilton - -	Do. -	A. G. Reid -	Boghead No. 4	Clay band, 8″ -	Do. -	6	40	4½×4½	129	4½×4½	129	2	300	30	5,450	Fur.	N.F.			
Do. -	Crossbasket -	Blantyre - -	Do. -	- - -	Crossbasket -	- - -	Do. -	—	—	5×4½	138	5×4½	126	-	—	—	—	—	—	Standing.		
Do. -	Greenhall - -	Do. - -	Do. -	Do. -	No. 1 - -	Clay band, 8″ -	Do. -	12	100	7×5	99	14×5	102	2	2,100	18	7,000	Fur.	N.F.	- - -	1	1
					No. 2 - -	- - -	- -	—	—	5½×5½	129	5½×5½	129	-	—	—	—	—	—			
Dunlop, James, & Co.	Blantyre - -	Do. - -	Do. -	- - -	No. 1 - -	Clay band -	Do. -	—	—	7×5	108	5×5	118	-	—	—	—	—	—	Standing.		
Do. - -	Blantyre Park -	Do - -	Do. -	Peter Niven -	No. 1 - -	Do. - -	Do. -	—	—	14×5	132	8×5	132	-	—	—	—	—	—			
Do. - -	Dykehead -	Hamilton - -	Do. -	Do. - -	No. 1 - -	Do. - -	Do. -	—	—	7½×5	192	4½×5	202	-	—	—	—	—	—			
Forsyth, William	Roughcraig	New Monkland -	Do. -	W. Forsyth -	No. 2 - -	Black band -	Do. -	—	—	6×5	180	4×5	180	-	—	—	—	—	—	Standing.		
Glasgow Iron Co.	Braidwood -	Carluke - -	Do. -	Jas. Orrock -	No. 30 -	Raes Gill, 7″ & 6″	Do. -	14	29	7½×5½	260	5×5½	278	1	2,000	49	5,547	Fur.	N.F.	- - -	1	1
Do. - -	Gilmerton -	Liberton - -	Edinburgh -	John McGowan	No. 22 - -	No. 2, Ironstone -	Do. -	—	—	11½×5½	360	8×5	180	-	—	—	—	—	—	(*See* Coal Mines.)		
				Do. -	No. 24 -	- - -	- -	—	—	—	—	—	—	-	—	—	—	—	—			
Do. - -	Rosslyn -	Lasswade - -	Do. -	Do. -	No. 1 - -	- - -	- -	—	—	—	—	—	—	-	—	—	—	—	—			
Monkland Iron and Coal Co. (Limited).	Armadale - -	Bathgate - -	Linlithgow -	Robt. Martin -	No. 15 -	Black band -	Do. -	11	37	7½×5	300	5×5	320	1	900	14	2,324	Fur.	N.F.	Coal also worked.		
					No. 16 -	Do. - -	Do. -	14	47	6×5½	192	4½×5½	208	1	1,020	16	2,880	Fur.	N.F.			
Do.	Chapelhall -	New Monkland -	Lanark -	Jas. Muir -	No. 4 - -	Calder Braes -	Do. -	4	25	—	—	4½×5	624	1	1,400	16	2,500	Fur.	F.	Do.		
					No. 5 - -	Do. - -	Do. -	10	72	9×5	624	4×5	624	1	600	20	5,500	Fur.	F.			
					No. 8 - -	Do. - -	Do. -	3	9	9×6	108	9×6	108	1	400	16	3,500	Fur.	F.	Do.		

List of Ironstone Mines, with the Mode of Working, Ventilation, &c., during the Year 1878—*continued*.

Name of Owner.	Name of Mine.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery, or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Monkland Iron and Coal Co. (Limited).	Bankend -	Lesmahagow -	Lanark -	John Adam -	No. 11 - -	B. B. and Clay band	L. -	66	22	13×5	96	6×3½	48	1	210	14	2,840	Fur.	N.F.	- - -	2	—
Do.	Spindleside -	Shotts -	Do. - -	Robt. Condie -	Nos. 1 and 2 -	Bellside - -	Do. -	—	—	—	—	—	—	-	—	—	—	--	—	(*See* Coal Mines.)		
Shotts Iron Co. -	Arden - -	New Monkland -	Do. -	James Ormiston	Arden -	Slaty band -	Do. -	18	34	8×6	498	6×5	522	2	1,150	25	7,890	Fur.	F.			
Do. -	Browmieside -	Do. - -	Do. - -	Do. -	Browmieside -	Do. -	Do. -	20	47	15×6½	648	6½×5	678	3	1,050	25	4,900	Fur.	F.			
Do. -	Polkemmet - -	Whitburn -	Linlithgow -	Robt. Jamieson	No. 5 - -	B. B. and Clay band	Do. -	23	69	5×7	264	5×5	162	1	980	25	5,500	Fur.	N.F.	- - -	—	2
					No. 9 -	Black band -	Do. -	25	42	—	—	5×5	132	1	800	25	8,700	Fur.	N.F.			
Do -	Harthill - -	Shotts - -	Lanark - -	Do. -	No. 1 - -	Do. -	Do. -	—	—	7×5	288	5×4½	295	-	—	—	—	—	—			
					No. 2 - -	Do. - -	Do. -	—	—	7×5	186	5×5½	108	-	—	—	—	—	—			
					No. 3 - -	Do. - -	Do. -	7	26	7×5½	186	5×5	132	1	450	25	4,000	Fur.	N.F.			
					No. 4 - -	Do., and White-stone.	Do. -	20	33	9×5	180	—	—	1	380	25	4,500	—	N.F.	No. 9, Polkemmet is the upcast.		
Do.	Kingshaw - -	Carluke - -	Do. -	Jas. Ormiston -	No. 5 - - -	3′ and 5′ Ironstone	Do. -	—	—	8½×4½	138	4½×4½	153	-	—	—	—	—	—	} Limestone also worked.		
					No. 8 -	Do. -	Do. -	4	16	8×4½	168	5×4½	153	1	423	21	2,400	Fur.	N.F.			
					No. 10 - -	Do. -	Do. -	—	—	4½×4	22	5×5	96	-	—	—	—	—	—			
Do. -	Pennicuik -	Pennicuik - -	Edinburgh -	Do. -	No. 1 Mine -	Black band -	Do. -	13	43	—	—	12×6	504	2	1,040	25	8,274	Steam	N.F.	- - -	1	3
					Greenlaw -	Do. - -	Do. -	—	—	13×5½	444	—	—	-	—	—	—	—	—			
					No. 2 Mine -	Do. - -	Do. -	27	94	—	—	5×6	870	3	1,130	25	9,350	Fur.	N.F.			
					Mauricewood	Do. - -	Do. -	—	—	14½×5½	516	12×6	516	-	—	—	—	—	—			
					No. 3 Mine -	- - -	- -	—	—	—	—	—	—	-	—	—	—	—	—			
					Eastfield No. 1	- - -	- -	—	—	—	—	—	—	-	—	—	—	—	—			
					Do. No. 2	- - -	- -	—	—	—	—	—	—	-	—	—	—	—	—			
Do. -	Loanhead -	Lasswade - -	Do. - -	Do. -	No. 1 - -	Black band - -	Do. -	—	—	—	—	—	—	-	—	—	—	—	—	(*See* Coal Mines.)		
Simpson, Wilson, and Co.	Legbrannock -	Bothwell - -	Lanark -	John Wilson -	No. 2 -	Black band -	Do. -	10	32	5×5	84	5×5	84	2	700	18	2,300	St. jet	N.F.			
					No. 3 -	Do. and Virtuewell.	Do. -	6	31	7×5	126	5×5	126	2	480	18	2,000	St. jet	N.F.			
Summerlee Iron Co.	Dunsyston -	Shotts - -	Do. - -	Alex. Faulds -	No. 1 -	Slaty band -	Do. -	6	28	11×5½	252	5½×4½	288	2	960	13	8,490	Fur.	F.	- - -	1	—
Do. -	Stepends -	Do. - -	Do. - -	Do. -	No. 5 -	Do. -	Do. -	7	66	4½×5⅓	426	8½×5½	466	3	312	15		Fur.	—	- - -	1	—
Wilson, George, & Co.	Kinneil - -	Bo'ness - -	Linlithgow -	Wm. White -	No. 1 Snab -	Upper Ironstone -	Do. -	16	73	15½×5½	540	9×5½	444	1	3,466	16	11,235	Fur.	N.F.	No. 2 Snab upcast. Coal also worked.		
					Schoolyard -	Do. -	Do. -	—	—	—	—	—	—	-	—	—	—	—	—			
					No. 24 Store -	Do. -	Do. -	13	42	9×5	186	15×5½	282	1	1,276	16	8,090	Fur.	N.F.			
Young, Robt. -	Greenhill - -	Shotts - -	Lanark -	- - -	No. 10 - -	Bellside - -	Do. -	—	—	—	—	—	—	—	—	—	—	—	—	(*See* Coal Mines.)		

List of Shale Mines, with the Mode of Working, Ventilation, &c., during the Year 1878.

Name of Owner.	Name of Mine.	Where situated.		Name of Manager.	Name of Pit or Mine.	Name of Seam and Thickness.	Mode of Working.	No. of Persons employed.		Size and Depth of Downcast and Upcast Shafts.				Number of Splits.	Average Length of Air-ways.	Sectional Area of Air-ways.	Average Total Quantity of Air in Feet per Minute.	Mode of Ventilation.	Fiery or Non-fiery.	Remarks.	Persons killed.	Persons injured.
										Downcast.		Upcast.										
		Parish.	County.					Above Ground.	Below Ground.	Size in Feet.	Depth in Feet.	Size in Feet.	Depth in Feet.		yards.	feet.						
Broxburn Oil Co. (Limited).	Broxburn	Uphall	Linlithgow	Alex. Kennedy	So. Greendykes	Shale, 6′	S.	11	110	9×6	—	6×8	78	2	944	45	30,000	Fur.	N.F.	Downcast is a mine.	—	1
					N. Greendykes	Do.	Do.	—	—	—	—	—	—	—	—	—	—	—	—			
					Hut	Do.	Do.	9	57	10×5	—	10×5	—	1	860	50	25,000	Fur.	N.F.	Do.		
					Albyn Mine	Do.	Do.	—	—	—	—	—	—	—	—	—	—	—	—			
					Stewartfield	Do.	Do.	—	—	9×5	—	6×4	30	—	—	—	—	—	—			
Dalmeny Oil Co. (Limited).	Dalmeny	Kirkliston	Edinburgh	James Jones	No. 2	Shale	Do.	4	52	11×5½	142	6×6	36	1	1,316	49	13,000	Fur.	F.			
					No. 3	Do.	Do.	4	21	14½×6	360	7	36	1	650	60	10,500	Fur.	F.			
Oakbank Oil Co. (Limited).	Oakbank	West Calder	Do.	R. Calderwood	No. 1	Do., 5′	L.	26	135	11×5	240	6×6	360	2	2,450	25	16,500	Fan.	F.	Fan 6′ diameter.		
Thornton, Thos.	Briech	Do.	Do.	—	No. 2	Fells Shale	S.	7	37	13½×6	216	11½×6	156	2	407	30	12,200	Fan.	F.	Fan 17′ dia. × 7′.		
Do.	Leavenseat	Do.	Do.	—	No. 2	—	Do.	—	—	14×6	111	12×5½	93	2	400	170	8,900	St.	N.F.	Limestone also worked.		
Uphall Oil Co. (Limited).	Hopetown	Uphall	Linlithgow	Wm. Fraser	No. 1	Broxburn	Do.	4	20	11½×5½	60	6×4¾	30	2	700	25	6,000	Fur.	N.F.			
					No. 2	Do., 4′ 9″	Do.	5	63	13½×5½	72	5×5	60	1	1,200	30	10,000	Fur.	N.F.			
Do.	Boghall	Bathgate	Do.	Do.	No. 3	Fells Shale	Do.	9	60	13½×5½	294	5½×3	270	1	1,200	16	8,000	Fan	F.	"Schiele" fan.		
					No. 4	Do.	Do.	—	—	12½×5½	132	5½×4	102	—	—	—	—	—	—			
Do.	Forkneuk	Do.	Do.	Do.	Forkneuk	Broxburn	Do.	6	39	12×5	118	6×4	48	2	400	36	8,000	Fur.	N.F.			
Do.	Niddrie	Winchburgh	Do.	Do.	Niddri Mine	Do.	Do.	2	4	10×6	180	6×4	30	1	60	50	3,000	—	N.F.			
West Calder Oil Co. (Limited).	Gavieside	West Calder	Edinburgh	John Weir	No. 1 Mine	Fells Shale, 3′ 11″	L.	8	30	7×8	1,440	4×4	3,516	2	2,930	16	14,650	Fur.	F.	Length of mines given in column for depth.		
					No. 3	Raeburns Shale	Do.	2	2	5×11	150	5×11	90	2	1,996	20	9,000	Fur.	F.			
Young's Paraffin Light and Mineral Oil Co. (Limited).	Addiewell	West Calder	Edinburgh	Thos. Prentice	No. 1 Muirhall	Thick Shale	Do.	—	—	8×5	360	4×5	360	1	1,250	20	10,290	Fur.	F.	—	—	10
					No. 2 do.	Do.	Do.	20	125	14×5½	492	—	—	2	1,583	24	25,355	Fan.	F.			
					No. 7 Polbeth	Do.	Do.	—	—	—	—	15×4¾	190	—	—	—	—	—	—			
					No. 8 do.	Do.	Do.	—	—	15×6	262	8×6	420	—	—	—	—	—	—			
					No. 10 do.	Do.	Do.	8	59	10×5	170	—	—	2	1,710	16	21,020	Fur.	F.			
					No. 11 do.	Broxburn Shale	Do.	9	26	15×6½	600	7×7	600	1	1,560	18	11,560	Fur.	F.			
					No. 12 Westwood	Thick Shale	Do.	13	78	—	—	12×5	126	2	1,380	16	20,000	Fan.	F.	Fan. 18′ × 5½′.		
					No. 13 do.	Do.	Do.	11	86	12×5½	204	—	—	2	1,468	16	—	—	F.			
					No. 15 Baads	Do.	Do.	18	88	14×6	600	10×6	600	2	1,650	20	25,000	Fan.	F.	Fan 16′ × 5′ 6″.		
					No. 20 Polbeth	Do.	Do.	—	—	16×6	432	5×6	610	—	—	—	—	—	—			
					No. 21 do.	Broxburn Shale	Do.	4	9	9×6	—	5×4	—	2	1,467	18	14,000	Fan.	F.	Fan. 18′ × 5′ 6″.		
					No. 5 Breichmill	Thick Shale	Do.	5	22	—	—	15×5½	108	—	—	—	—	Fan.	F.	Fan. 24′ × 8′.		
					No. 22 Harwood	Do.	Do.	4	10	12×6	264	5×6	264	2	433	20	6,000	St. jet	F.			
					No. 23 Baads	—	—	4	2	7×5½	90	4×5½	90	—	—	—	—	—	—	Sinking.		

List of Fire-clay Mines, with the Mode of Working, Ventilation, &c., during the Year 1878.

Baird, John	Greenfoot	New Monkland	Lanark	—	No. 1 Mine	—	—	1	2	—	—	—	—	—	—	—	—	—	—	Opening.		
Dunnachie, Jas.	Star	Do.	Do.	—	Nos. 1 and 2	Glenboig, 6′	S.	3	35	13×5½	102	8×5½	102	1	930	72	12,600	Fur.	N.F.	—	—	1
Glenboig Fire Clay Co.	Glenboig	Do.	Do.	—	No. 1 and Mine	Do. 6′	Do.	6	37	13×[illegible]	78	10×[illegible]	—	2	800	30	2,900	Nat.	N.F.			
Wilson, Alex., & Co.	Lockhead	Dunfermline	Fife	R. Hamilton	—	—	Do.	2	8	8×4	77	6×4	77	1	100	42	10,000	Nat.	N.F.			

IN MINES CLASSED UNDER THE METALLIFEROUS MINES ACT.

LIST of MINES in EASTERN DISTRICT of SCOTLAND in 1878.

Owner or Company.	Name of Mine.	Where situated.	Remarks.
Aitken, Henry	Bathgate	Linlithgow	Nickel silver (not working).
Feedonald Mining Co.	Feedonald	Argyleshire	Lead ore ditto.
Strontian Mining Co.	Strontian	Ditto	Ditto ditto.
Loch Tay Mining Co.	Loch Tay	Perthshire	Ditto ditto.
Tyndrum Mining Co.	Tyndrum	Ditto	Ditto ditto.
Leadhills Silver-lead Mining and Smelting Co. (Limited).	Leadhills	Lanarkshire	Ditto.
Walker, John (Edinburgh)	Sandlodge	Shetland	Iron ore and copper ore.
Dunkeld Slate Co.	Dunkeld	Perthshire	Slate.
Harris, J. A.	Birnam	Ditto	Ditto.
Baird, Sir David, Bart.	Burdie House	Edinburgh	Limestone.
Clerk, Sir Geo. D., Bart.	Brunstane	Ditto	Ditto.
Baird, Wm., and Co.	Westfield	Ditto	Ditto.
Hyslop, Jonathan	Cobbinshaw	Ditto	Ditto.
Straiton Estate Co. (Limited)	Straiton	Ditto	Ditto.
Thornton, T. and J.	Leavenseat	Ditto	Ditto.
Torrance, William	Camps	Ditto	Ditto.
Turnbull, Wm., and Co.	Hope	Ditto	Ditto.
Ditto	Magazine	Ditto	Ditto.
Coltness Iron Co.	Mayfield	Lanarkshire	Ditto.
Haig, John, and Co.	Nellfield	Ditto	Ditto.
Dunlop, James, and Co.	Greenblairs	Ditto	Ditto.
Hamilton and Co.	Poniel	Ditto	Ditto.
Houston, James	Auldton	Ditto	Ditto.
Ditto	Netherton	Ditto	Ditto.
McGhie and McLean	Auchren	Ditto	Ditto.
Shotts Iron Co.	Kingshaw	Ditto	Ditto.
Ure, Robt.	Dykehead	Ditto	Ditto and cement stone.
Lathalmond Lime Co.	Lathalmond	Fifeshire	Limestone.
Russell, James, and Co.	Standhill	Linlithgow	Ditto.

LIST of the FATAL ACCIDENTS and LOSS of LIFE arising therefrom, in MR. MOORE'S DISTRICT, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
July 15	1	Standhill, Limestone Mine.	Bathgate, Linlithgow.	Jas. Russel and Sons -	A. Haslin - -	Miner -	—	Fall of roof at face - - -	–	1	–	–	–
„ 25	2	Leadhills, Lead Mine.	Leadhills, Lanark	Leadhills Silver Lead Mining and Smelting Co. (Limited).	John Moffat	Sinker -	42	Fell down shaft. He attempted to step off a ladder into the kettle to ascend, and missed his footing.	–	–	1	–	–
Sept. 5	3	Magazine, Limestone Mine.	Pathhead, Edinburg.	Wm. Turnbull and Co. -	Wm. Bain - -	Miner -	—	Fall of rock - - - -	–	1	–	–	–
								Total - (3)	–	2	1	–	–

Report of Assistant Inspector.

Cambuslang, Glasgow,
26th March 1879.

Sir,

In pursuance of section 48 of the Coal Mines Regulation Act, 1872, and section 20 of the Metalliferous Mines Regulation Act, 1872, I have the honour to report to you that during the past year I have exercised the duties of Inspector in the district of East Scotland, and that in so doing I have acted as assistant to and under the directions of Mr. Ralph Moore, the Inspector for that District.

I have, &c.,
J. T. ROBSON.

The Right Hon. R. A. Cross, M. P.
Her Majesty's Principal Secretary of State,
Home Department.

Mr. Wales' Report.

REPORT on the WORKING of the MINES INSPECTION ACT (23 & 24 Vict. c. 151.) for the SOUTH WALES DISTRICT for the Year ended 31st December 1878.—By THOMAS E. WALES, Esq.

SIR, Swansea, 29th March 1879.

As Inspector under the Coal and Metalliferous Mines Acts for the South Wales District, which comprises nearly the whole of the counties of Glamorgan, Carmarthen, Pembroke, and a part of Breconshire, I have the honour to report as follows for the year ended 31st December 1878.

The total quantity of minerals raised was 12,097,206 tons, as against 11,889,210 tons in 1877, giving, notwithstanding the depressed state of the coal trade, an increase of 207,996 tons in 1878.

The number of persons employed was 43,934, as against 44,812 in 1877, thus giving a decrease of 878 persons employed in 1878.

The total number of accidents was 111, with a loss of 124 lives, as against 101 accidents with a loss of 122 lives in 1877.

7	lives	were lost	by 5 explosions of gas,
21	,,	,,	by falls of coal,
41	,,	,,	by falls of stone,
1	,,	,,	by suffocation,
22	,,	,,	in shafts,
12	,,	,,	by trams on engine planes and horse roads,
4	,,	,,	by an irruption of water,
2	,,	,,	by sundry causes and on surface,
3	,,	,,	by a boiler explosion, and
11	,,	,,	by miscellaneous causes.

Explosions of Gas.

The first (No. 24 in the list) occurred on the 20th of March in the Clynmil Colliery belonging to the Plymouth and Aberdare Coal and Iron Co., Merthyr Tydfil, resulting in the deaths of Thomas and Hugh Davies, brothers, aged respectively 19 and 13. This colliery was worked with open lights and not safety lamps, and in that portion of the colliery where the explosion occurred there were two doors placed on the heading to direct the air into the place where the two deceased were intended to work. Two or three labourers were engaged in this heading during the previous night and up to 3 or 4 o'clock on the following morning; the fireman also made his examination about the same time. About 7 o'clock a.m. one of the workmen named Gomer Thomas, who was an old and experienced collier, went to his work and found one of the two doors open; this, doubtless, had been so for a sufficient length of time to allow gas to accumulate. Gomer Thomas closed this door, and when the collier with whom the two deceased were working arrived Gomer Thomas told him that he had found the door open and had closed it. The effect of closing the door was to carry off the gas which had collected in the road along which the two deceased and the other collier were proceeding to their work, and all three having open lights immediately on coming into contact with the gas it was exploded with the sad result already stated. When I made my examination of the district, a day or two after the explosion, I had one of the two doors left open and the result was such as to leave no doubt whatever, in my mind, that the explosion was caused by the door being neglected, either by the fireman or one of the labourers; and although the inquest was of a most searching kind the evidence was so conflicting that the jury could not arrive at any satisfactory conclusion as to who had neglected the door. I recommended that locked safety lamps should be used and open lights discontinued. The following verdict was returned by the jury—"Death from suffocation consequent upon an explosion of gas caused by a door "being left open, the evidence not being sufficiently conclusive as to who left the door open." The second explosion (No. 15), also resulting in the loss of two lives, occurred in the Dunraven Colliery, belonging to Mr. Thomas Joseph, and situated in the Rhondda Valley. This colliery was worked with locked safety lamps, but shot firing was allowed, the shots

being fired by a shot firer or a person appointed for the purpose. The shot firer stated most positively at the inquest that immediately before firing the shot he carefully examined the place and found it quite free from gas, and although, when I made my inspection, I found no gas, I was of opinion that the shot firer had not made a proper examination, or he would have detected the gas which was ignited by the shot. At the inquest, however, the evidence went to show that no gas had been discovered there previously. I have repeatedly stated both at inquests and in my reports that shot firing should be strictly prohibited in working the fiery steam coals of this district. I recommended the owner of the colliery to discontinue shot firing, and this he promised to do.

No. 3 explosion (No. 76 in the list) occurred on the 16th of August in the No. 1 Vochriw Colliery, belonging to the Dowlais Iron Co., Dowlais, resulting in the loss of one life. This colliery is worked with open lights, and on the day of the explosion one of the hauliers had temporarily drawn back the cloth which directed the air into the place where the deceased and others were working. In consequence of this a little gas accumulated on the rise side of the stall and was ignited by the open light of deceased, who had been sent into that part of the stall by the collier with whom he worked. The haulier stated that when he drew back the cloth he apprised the collier of it, and told him to be "careful." On the other hand, the collier said he did not understand the haulier. Between the collier and the haulier there had doubtless been great want of care, to which this explosion is fairly attributable.

The fourth explosion (No. 82), resulting in the loss of one life, occurred in the Marine Rhondda Colliery, belonging to the Marine Rhondda Steam Coal Co., on the 4th of September.

This colliery was also worked with safety lamps, but, as in the Dunraven case just referred to, shot firing was allowed. This is similar to the Dunraven case, with this exception, that at the inquest it was elicited that for several days previous to the explosion gas had been lodged not far from where the shots were being fired, and, as I consider that to be a violation of the first general rule, I reported the case, and, by your instructions, proceedings were instituted against the manager, who was fined 10*l.* and costs.

The fifth and last explosion (No. 86) occurred in the Dunraven Adare Colliery, belonging to the Dunraven Adare Co., situated near Glyn Neath, Neath Valley, on the 18th of September, causing the loss of one life. The deceased, who acted as a mason, had built a "dam" or wall to stop back some water, and about 18 hours afterwards he took out a brick, and it is supposed that a little gas had accumulated beyond the wall, which on the removal of the brick came in contact with his open light and exploded. The number of lives lost by explosions in 1877 was 23, as against 7 in 1878, which is a favourable comparison.

Suffocation.

Only one death has arisen from this cause and the deceased alone was to blame. He, in disregard of the fireman's instructions, proceeded beyond the danger signal where gas had accumulated.

Falls of Stone from Roof and Coal.

Sixty-two deaths have occurred under this head as against 54 in 1877, being an increase of eight. It will be noticed that the deaths under this head amount to 50 per cent. of the deaths from all other causes. This is a very serious matter, and one demanding the serious and vigilant attention of all interested in working the mines in this district. I have always, when referring to this matter, stated that the roofs overlying nearly the whole of the coals in this district are of a dangerous and treacherous nature, and such as often to mislead and deceive the most careful and experienced persons; still I am of opinion that if greater care were exercised by the colliers themselves, who, as a rule, fix the timber, and also if the officials, especially the overmen and firemen, who see the working faces much more frequently than the other officials, were more vigilant in seeing that the colliers fix the timber where and when required, the fatality from falls would, to some extent at least, be reduced. Both when investigating such accidents and at inquests I point out to the officials, managers, overmen, and firemen, that although they may put the colliers or any other class of men to do the timbering, the 16th General Rule of the Coal Mines Inspection Act holds them responsible for it being properly done.

Shaft Accidents.

Sixteen accidents have occurred under this head with a loss of 22 lives, being an increase of 6 deaths; this is due to two serious accidents resulting in the loss of two and three lives respectively, and these are the only cases requiring special reference. Three lives were lost

by over-winding; seven by falling whilst ascending or descending; eight by things falling from part way down, and three from miscellaneous causes.

About 5 o'clock on the morning of February 26, seven persons were ascending the shaft at the Main Colliery, belonging to the Dynevor Duffryn and Neath Abbey United Collieries Co., (Limited). The shaft is about 300 yards deep, and when the cage containing the seven persons was nearing the surface the engineer found he could not stop the engine; the cage was drawn up to the sheave, two of the men fell down the shaft and were killed, the remaining five miraculously escaping by clinging to the cage until assistance arrived and they were released. At the colliery there are two engines, viz., one for winding and one for pumping; Henry Sims was the person in charge of both engines at the time, the winding engine only working a few turns during the night, and the pumping engine not requiring constant attention. Edward Boedycombe and Rees Price were the two stokers at the boilers; the former, who was 22 years of age, was working the engine when the seven men were ascending, and immediately after the occurrence stated that he could not close the throttle valve, and consequently could not stop the engine and hence the sad catastrophe. On an examination being made it was discovered that a "pin" was missing from the "stop" valve, which was found close to the throttle valve. It was therefore surmised that this pin had got under the throttle valve and prevented Boedycombe from closing it. As already stated Boedycombe, who was working the engine, was only a stoker and not an engineer, and I ascertained that although both the colliery manager and the mechanical engineer knew he was in the habit of working the engine at nights neither of them had given Boedycombe a "certificate of competency" as required by the 65th special rule, which states shortly that an apprentice shall not be allowed to work an engine until he has received a written certificate of competency either from the manager or the mechanical engineer, &c. I also ascertained that the engineer, Henry Sims, had not received any authority from the manager or mechanical engineer in accordance with the 62nd Special Rule. I may state it is highly probable that the pin did get under the throttle valve and prevented Boedycombe from closing it, still I was of opinion that if the engine had been under the care of an experienced engineer the accident might have been prevented, and as I considered the two special rules already referred to had been infringed, the case was reported accordingly, and, by your instructions, proceedings were instituted against the manager, mechanical engineer, and the engineer in charge of the engine; the magistrates, however, dismissed the summonses.

On the 22nd of May, Thomas Evans, the certificated manager of the Bryncethin Colliery, belonging to the Barrow Steel and Iron Co., was killed whilst engaged at the bottom of the shaft, by the ascending water barrel being overwound and falling down upon him. This accident was fairly attributable to the carelessness of the deceased himself in allowing the engineer to work the engine when he was engaged at the bottom of the shaft, and also to the engineer in doing so.

About 6.30 p.m. on the 8th of November three men were killed whilst descending the upcast shaft of the Bwllfa Colliery, situated at Aberdare and belonging to the Bwllfa Coal Co. (Limited). On the day in question the "day shift" of workmen finished about 5 o'clock p.m., and the arrangement was for the night shift men to descend about 7 o'clock p.m. During these two hours no work is done, and there is no one in charge of the top of the pit; some little time however before 7 o'clock three of the night colliers went to the colliery; one unlocked the "fans" which had been locked by the day banksman, and ought not to have been unlocked except by the night banksman at 7 o'clock p.m., another signalled to the engineer, and all three descended the shaft and reached the bottom safely. The three deceased then got on to the cage and were descending when the cage caught the fans (which had been unlocked by one of the three men who had just descended) and its occupants were precipitated to the bottom, a depth of 104 yards, and killed.

The sad accident and loss of life were clearly caused by the recklessness of the three deceased and the others in unlocking the "keps" or fans, and descending before the arrival of the night banksman, which was a flagrant breach of the rules in force at the colliery.

Accidents and lives lost by Trams on Engine and Inclined Planes and Horse Roads.

Twelve accidents have occurred under this head with a loss of 12 lives, as against 13 accidents with a loss of 13 lives in 1877. I have in former reports referred to the great danger attending the present practice of allowing the door-boys to run in front of the horses to open the doors. In my opinion these boys are physically unable to perform such arduous work, and they ought to remain stationary at their doors, and be prevented from travelling with the hauliers. More than half of these accidents were, I consider, due to this dangerous system; the remainder were due, for the most part, to the deceased themselves, either by being confused or in not exercising sufficient care when travelling on the engine planes, and so coming in contact with the trams. In all these cases the Act, with reference to having places of refuge, &c., had been complied with.

Inundations of Water.

About 9.30 a.m. on the 16th of April an inundation of water took place at the Western Moor Colliery, situated near Neath and belonging to Messrs. John and Williams, resulting in the loss of four lives. At the time of the inundation 17 men were in the mine, 13 of whom fortunately made their escape and reached the surface safely. At the inquest, which continued several days, and was of a most searching nature, nearly all the survivors, together with the manager and overman, were examined as witnesses, and I beg to append a copy of their evidence, &c.

"THE WESTERN MOOR COLLIERY ACCIDENT.

"*The Adjourned Inquest.*

"Mr. Cuthbertson, coroner, resumed his inquiry on Thursday, at the county police station, Neath, into the circumstances attending the death of the three men—Rees, Williams, and Llewellyn, and the boy David Davies—in the accident at the Western Moor Colliery, on Tuesday, the 16th instant. Mr. Wales, Government Inspector of Mines, was present. The first witness called was Mr. Thomas, mining engineer, who handed in plans of the colliery, which, he said, had been made under his supervision. He examined the slant on the 5th of April before the accident. He went in with the proprietors, but did not hear anything said about water, nor was there any reason to suspect anything out of the ordinary course.

"Sarah Davies said she lived at the Rope Walk. Her son's name was David Davies. His age was 14. He had worked at the colliery about six months. On Tuesday week he went to work at the colliery about 6 o'clock in the morning, and was drowned there. He had never said anything to her about the workings, or that there was water there. She had never asked him to leave the colliery.

"David Llewellyn, fireman at the colliery, residing in Bush Row, said the slant was made about the beginning of last summer. It was about 100 yards long, and there were workings on both sides of it. The workings on the north side of the slant were from 120 to 140 yards long. There was a fault there which stopped any further working. He didn't know anything about the old workings. Was in the colliery on Tuesday, the 16th instant. There were about 15 men working there that morning, on both sides of the slant. There was no working going on at Nos. 1 and 2 stalls on the south side of the slant. They had struck a fault there. They were cutting coal. He was there when the water broke in, repairing the road, six or seven yards from the stall where the water broke in. It was about a quarter or half-past 9, when the water broke in. He did not expect to find any water there. Saw nothing to lead him to suppose they were getting into any old workings. There were a few drops of water in the stalls leading to the fault. No. 6 was the stall where the water broke in. He expected to get to the fault there. There were five stalls between No. 6 and the slant. Had struck the fault in three stalls on the south side of the slant. In the other two stalls between he had not struck the fault, not having got to them, but he expected to strike the fault there in two or three days, as well as in the other three. John Williams was the man who struck into the water, and he (Williams) escaped. Three men and a boy were drowned, and the body of one of the men had not yet been found. When Williams broke into the water there was not a very great quantity there; it was going down hill. The man did not strike the mandril into the old workings, but the weakness of the coal gave way before the water. Witness did not know of the existence of the old pit. He knew of an old pit or two on the north side of the drift, but not on the south side.

"By Mr. Wales: Had been fireman there since the works commenced. There was a fault on the north side of the slant. They went through it at the drift. It was a down-throw, about five yards. Did not know why the fault was not put through on the north side. The reason they stopped the stalls on the south side was that there was no coal there. Had not seen any water in the old pit nearest the slant, when he went down it last summer, and before they began this slant. They did not use bore rods for water. They thought the fault sufficient, and they did not think of water. After the water had burst in it continued to run for about a quarter of an hour, and it filled up to the roof, and that prevented them from getting down to the men and the boy. They rescued two men, who were coming out. The name of the man still missing was Rees Llewellyn. He was working on the south side of the slant, and the others who were drowned were working on the north side.

"By a juryman: No attempt was made to ascertain what was on the other side of the fault. They drove through it at the drift, and did not meddle with it afterwards.

"By Mr. Wales: When the water burst away there were from 2½ feet to a yard of coal there. John Williams was working there when the water broke in.

"Morgan Mainwaring, residing at Neath, said he was a collier working at Western Moor Colliery. Was working there on the 16th of April, on the south side of the slant, in the sixth stall beyond where the water broke in. Had worked there about four months. Knew nothing of any old workings there. He knew of the fault, but nothing of the old workings the other side of it. They expected nothing but the fault before them. Never heard the colliers say anything of old workings there. There were four stalls between where he was working and where the water broke in. The water went down on the lower side. Had no idea of any old workings surrounding the spot in question.

"By Mr. Wales: Witness saw the fault, and proved it. It was running towards the slant. Didn't know the reason why they did not go through the fault on the north side, except that they thought the coal had been worked out. James Lewis told witness he had proved the fault in his (Lewis's) stall. That was a day or two before the accident happened; that was before the water broke in. Could not tell which stall James Lewis worked in.

"Ellis Parry, of Carisddu, collier, said he had been working at the Western Moor Colliery. Was there on Tuesday, the 16th instant, when the accident occurred. Was working on the south side in No. 5 stall. Did not hear the water break in. Witness was about 40 or 45 yards from the heading. He expected every minute to come against the fault. Knew nothing of old workings on the south side. If he had, he would not have been so foolish as to work there. The reason they did not work through the fault was because they did not expect coal above it. He did not know why. Had heard nothing of water being on the other side. None of the water came into his stall. Knew John Williams, into whose stall the water came. Did not know whether Williams struck his mandril into the water, or whether the water burst in. He could not see, as there was a pillar between them. Heard nothing about the water until Thomas Llewellyn told him they had struck the water. He and his son were quietly working at the time Llewellyn told them. Witness told his son to take time, not to be too wild, and they would find their way out through the air-way. Witness did not get into six inches of the water in going to the slant.

"By Mr. Wales: The fault was now to be seen in stalls Nos. 1 and 2, on the south side. The same fault was to be seen in the slant.

"By a juryman: Had been a collier 42 years, and had worked in many other collieries besides the Western Moor Colliery. Was quite satisfied to work in the Western Moor Colliery so far as its safety was concerned.

"Thomas Griffiths, Pantyrheol, collier, said he was working at the Western Moor Colliery when the water broke in. Was working at the bottom of the north heading. Went to work about 7, or a quarter past 7, that morning. Saw Llewellyn that morning, who told him all was right. Witness had worked at this colliery about two years, and had been a collier for 40 years. He never knew of any old workings near the slant. Was at his work at the time the water broke in. When he heard the water coming down he went a few yards to meet it. He went through it a short way, but was tumbled back and knocked to the bottom. He worked his way all the time against the water and kept his senses. He saw a light, and drew towards it, and David Llewellyn assisted him when he came up to the drift. Had never heard of any water being close to the place. They were working towards the fault, and they never expected any water. Witness had worked two or three stalls to the fault. Did not know why the fault was not worked through. Knew nothing of the old workings. David Davies, John Rees, and Llewellyn Williams, were working in the same place with him.

"By Mr. Wales: Witness struck three stalls into the fault in the north heading. Found no water in doing so. Had not a drop of water near the fault.

"William Jones, of Neath, said he was a haulier on the slant at the Western Moor Colliery. Was there on the 16th of April, but was on the surface when the water came in. Had worked there about three months. Knew nothing of any old working there, nor ever heard of water being likely to burst in upon them. Witness knew that they had struck a fault. Witness found the bodies of David Williams and John Rees about a quarter of an hour or 20 minutes after the water bursted in.

"James Lewis, collier, working at Weston Moor Colliery, said he had been engaged at the colliery ever since it had been opened. Was there on the 16th of April when the water came in. Was working in the stall next to the slant. Had never heard of any old workings there, nor of any water, except a few drops. Had never anticipated that water would break in upon them. He thought the reason why they did not work through the fault was that they thought there was no coal there.

"By a juryman: Had no reason to find fault with the works.

"At this stage of the proceedings the inquiry was adjourned till half-past 11 on Tuesday next, one of the principal witnesses, who is at present under medical treatment, not being able to attend.

"*Inquest resumed.*

"John Williams, collier, working in Western Moor Colliery.—I have been a collier 13 years. I was working in the Western Moor Colliery on the 16th of this month. I was working on the south side of the slant. I worked in No. 6 stall. Rees Llewellyn worked in the same stall with me. His body has not yet been recovered. When I first went that morning I was cutting coal. We had worked two trams of coal that morning. Rees Llewellyn was waiting for the boy to bring the tram, and I was standing timber when the water burst in without any notice at all. I never heard of any old workings being near the place. I saw no signs of water, and we were expecting every day to strike the same fault which had been struck in the other stalls. I was on my knees. I was struck on the head, but I could not say whether by coal or a stone. We were both washed down the stall to the heading, and from there to where the trams were sent up the slant. I do not know what thickness of coal there was when the water broke in. I had worked on the north side of the fault. I had not struck the fault. They never worked through the fault on either side. They told me that there was no coal on the other side of the fault, and not because there were any old workings on the other side, oh dear, no. I have worked in the Western Moor five months. I never heard of any old workings at all, nor I never saw any signs of water. I worked in the stall No. 6 up to between 3 and 4 o'clock on the Monday, the day before, and I saw no change in anything. We were expecting to strike the fault every minute. I saw no alterations in the coal when I left the day before. I was busy setting a post when the water broke in.

"Mr. William John.—The Western Moor Colliery belongs to myself and Mr. Williams. I managed the colliery. I did not know of any old workings being near us, and I never saw any signs of water. We were working the coal on the north and south sides between two faults. We did not go through the fault on the rise side, because we believed there was no coal beyond it. The body of Rees Llewellyn has not been recovered yet. It is under a large fall. The slant has been working

about 18 months. We employed from 20 to 25 men, but never so many as 30. When we were driving down the slant we came across some old workings. The old workings which we went through did not contain any water. I am positive of that. When we had rain we used to get water. My opinion was that the old workings which we struck communicated with all the old workings there, and consequently that there was no accumulation of water. I searched for other old workings, and found all were quite dry and free from water. I had been in No. 6 stall between 11 and 12 o'clock a.m. the previous day. I went through the whole of the colliery that day. I met with nothing unusual in any part of the colliery. I went underground nearly daily. Nobody ever said anything to me about the water, and I made inquiries.

"The jury retired, and after an absence of about 10 minutes returned the following verdict:—

"It is the unanimous verdict of the jury that the two deceased came to their deaths by the accidental flooding of the Western Moor Colliery, and that the manager is exonerated from all blame."

Both from my inspections (one of which was made on the day of the inundation) and the evidence given at the inquest, I entirely agree with the verdict of the jury.

Accidents and lives lost on Surface.

Twelve accidents have occurred under this head with a loss of 14 lives, being, I am sorry to say, an increase of 10 as compared with 1877.

2 persons were killed by trams,
1 by a chain,
3 by a boiler explosion, and
8 by trucks.

On the 5th of March a boiler explosion occurred at the Callan's Pit, Landore, belonging to Messrs. Vivian & Sons. The boiler was one of four used for supplying steam to a large pumping engine which lifts the water from several of the collieries in the immediate neighbourhood; the boiler was 37 feet long, 6 feet 4 inches diameter, with an internal flue 4 feet diameter, original thickness of plate $\frac{7}{16}$ of an inch which had been reduced to $\frac{6}{16}$. The pressure of steam 30 to 35 lbs. per square inch. It was known as the Cornish boiler, and had been at work for a period of 20 years. About 18 months, however, before the occurrence, the boiler had undergone extensive repairs. The immediate cause of the explosion was the collapse of the internal flue. Several mechanical engineers were examined at the inquest, and stated that in their opinion the explosion was due to a want of water. I made several careful inspections of the tube after the explosion, but saw nothing to convince me that there had been such a want of water, and in my opinion the explosion was rather to be attributed to the internal flue (which was of too large a diameter) being too weak to longer resist the pressure of steam. At the inquest I recommended that the internal flue should never exceed half the diameter of the boiler, and this I believe is being carried out in building new boilers of similar construction.

Two persons were killed by riding on trams against the rules of the collieries, one by a chain breaking and striking the deceased when walking down an engine plane, and the remaining eight were killed by trucks and do not call for any special notice here.

Non-fatal Accidents.

In addition to the number of lives lost 432 persons were more or less seriously injured during the year under consideration.

35 explosions of gas occurred injuring 43 persons,
9 explosions of gunpowder injuring 10 persons, and
1 explosion of dynamite injuring one person.

The explosions of gas occurred in the following collieries and on the following dates:—

January 3rd. Penydarran, one person injured.
January 2nd. Garnant Colliery, one person injured.
January 11th. Primrose Colliery, three persons injured.
January 17th. Rhydding Colliery, two persons injured.
January 25th. Dinas Main Colliery, two persons injured.
January 26th. Lewis Merthyr, one person injured.
January 28th. Llest Colliery, explosion of gunpowder, one person injured.
February 23rd. Garnant Colliery, one person injured.
March 1st. Fernhill Colliery, two persons injured.
March 1st. North Llantwit, one person injured.
March 5th. Plymouth, one person injured.
March 6th. Abernant, one person injured.
March 7th. Plymouth, one person injured.

March 8th. Rhondda Merthyr, explosion of gunpowder, two persons injured.
March 14th. North Llantwit, three persons injured.
April 1st. Cae Colliery, explosion of gunpowder, one person injured.
April 2nd. Danygraig, explosion of gunpowder, one person injured.
April 17th. Brynhitus, explosion of gunpowder, one person injured.
April 25th. Dinas Main, explosion of gunpowder, one person injured.
April 30th. Dunraven Adare, one person injured.
May 27th. Danygraig, one person injured.
June 1st. Harris' Navigation, explosion of dynamite, one person injured.
July 20th. Garnant, one person injured.
August 19th. North Llantwit, one person injured.
September 4th. Marine Rhondda Colliery, three persons injured.
September 12th. Gwaun Cae Garwen Colliery, explosion of gunpowder, one person injured.
September 16th. Cwmaman Colliery, two persons injured.
September 17th. Dinas Isha Colliery, one person injured.
September 17th. Ynishir Steam Coal Colliery, explosion of gunpowder, one person injured.
October 5th. Bargoed Colliery, two persons injured.
October 10th. Penydarran, No. 2 Pit, two persons injured.
October 28th. Dinas Isha, one person injured.
November 21st. Main Colliery, explosion of gunpowder, one person injured.
December 12th. Coedcae Colliery, one person injured.
December 18th. Main Colliery, seven persons injured.

Out of the 35 explosions 29 occurred where open lights and six where safety lamps were being used. With the exception of the first case prosecuted under the 32nd Section, no mines have been found in a dangerous state from the abundance of gas without explosions occurring.

Prosecutions.

1878.

April 28th. Manager of the Main Colliery for breach of special rules, summons dismissed.

April. 28th. Mechanical engineer (Main Colliery) for breach of special rules, summons dismissed.

April 28th. Engineer (in charge of engine), Main Colliery, for breach of special rules, summons dismissed.

The above cases were heard at the Police Court, Neath, by Rev. D. Griffiths and Griffith Llewellyn, Esq.

August 7th. John Chubb, manager of the Dinas Colliery, for violation of the first General Rule, fined 10*l.* and costs.

August 7th. N. Morris, overman, Dinas Colliery, for violation of No. 2 General Rule, fined 1*l.*

August 7th. David Lewis, fireman, Dinas Colliery, for violation of No. 2 General Rule, fined 2*l.*

These three cases were heard at the Pontypridd Police Court by G. Williams, Esq., Stipendiary Magistrate, and F. R. Crawshay, Esq.

November 4th. Evan Foster, manager of the Ystrad Fawr Colliery, for violations of the 1st and 6th General Rules, fined 2*l.* 10*s.* in each case.

This case was heard at Ystradgynlais Police Court, Breconshire by the Rev. Dr. Walters and G. Gough, Esq.

On the 22nd of January 1879, William Rosser, manager of the Marine Rhondda Colliery, Pontypridd, was fined 10*l.* and costs for violation of Sub-section F. No. 8 General Rule.

On the same day and at the same place, Evan Williams, fireman, Marine Rhondda Colliery, was fined 2*l.* and costs for violation of Sub-section 1, No. 8 General Rule.

These two cases were heard by G. Williams, Esq., Stipendiary Magistrate, and F. R. Crawshay, Esq., and on the 5th of February last at the same place and by the same magistrates Omar Cook, engine-driver, was fined 2*l.* and costs for violating No. 8 Section Coal Mines Regulation Act, 1872, in falsifying his son's certificate of birth.

On the 15th of February last, William George, manager of the Western Merthyr Colliery, was fined 5*l.* for violation of No. 3 General Rule. This case was heard at Swansea by Morgan B. Williams, Esq., and Trevelyan Jenkins, Esq.

By your instructions also two cases have been prosecuted under the 32nd section of the Coal Mines Regulation Act, 1872. In both these cases the evidence showed that the

existence of dangerous accumulations of gas was known to the managers, who allowed the men to continue working in close proximity to the gas. This is a most deplorable state of things, and ought never to be allowed under any pretext whatever, and as I consider these prosecutions have had a good effect in the district, I annex the evidence given on each occasion with a view to making the decisions as public as possible.

The first case was heard at Cardiff on Tuesday the 19th of November 1878, and the second at Swansea on the 3rd and 4th of January 1879.

"GROSS NEGLIGENCE AT THE DINAS COLLIERY.

"*Suspension of the Manager's Certificate.*

"An inquiry of considerable importance to the coal-mining interest was held at the Cardiff Town Hall, on Tuesday, by Mr. H. C. Rothery, Wreck Commissioner, assisted by Mr. Thomas Cadman, Inspector of Mines for the Monmouthshire District, as assessor, into the conduct of John Chubb, the certificated manager of the Dinas Colliery, owned by Messrs. Coffin and Co., and situated at Llantrisant, Glamorganshire. Mr. Thomas Williams (Williams and Lewis, solicitors, Merthyr) conducted the case in behalf of the Home Secretary, who instituted the investigation. The defendant was represented by Mr. W. Simons, solicitor, Merthyr. At the opening of the proceedings the defendant handed to the court his certificate of service.

"Mr. Williams, in opening, read the statement of the case against Mr. Chubb, which was in effect as follows:—'As to Dinas Colliery, there are two pits from the surface, one known as the lower 'pit, which is the down-cast pit, the other known as the middle pit, which is the up-cast pit. The 'lower pit, passing through the 2 ft. 9 in. seam of coal, proceeds to the 4 ft. or Polka seam. The 'middle pit passes through the 2 ft. 9 in. seam and the 4 ft. or polka seam, and descends to the '6 ft. seam. It is alleged that John Chubb, the certificated manager, by reason of incompetency or 'gross negligence, is unfit to discharge his duties, and that he has been convicted of an offence 'against the Coal Mines Regulation Act. The allegation is founded upon the following circum-'stances:—That he contravened and did not comply with the first General Rule contained in the 'Mines Regulation Act, by not producing or causing to be produced in the mine an adequate amount 'of ventilation to dilute and render harmless noxious gases to such an extent that the working places 'of the shafts, levels, stables, workings, and the travelling roads to and from such working places 'were in a fit state for working and passing therein. That he contravened and did not comply with 'the second General Rule contained in the Act, by not recording or causing to be recorded without 'delay in a book kept at the mine for the purpose, and to be signed by the person making it, a true 'report of the condition of the mine so far as ventilation is concerned. That he contravened and 'failed to comply with the 60th Special Rule applicable to the mine, by not immediately suspending 'or causing to be suspended all operations in the mine or part thereof, and removing all persons 'therefrom, and preventing any person again entering until the danger had been removed, and the 'mine or part in question had been restored to safety. The violations of the rules are in respect of 'the hard heading in the 4 ft. or Polka seam, and of William Moore's heading in the 2 ft. 9 in. 'workings, except as far as the general inadequate ventilation of the mine may have contributed to 'the matters of complaint. The third allegation is that on the 7th of August last John Chubb, as 'manager of the Dinas Pit, was convicted by the stipendiary magistrate for the district of Pontypridd 'of an appeal against the Act by contravening and failing to comply with the first General Rule, and 'fined 10*l.* and costs.' Mr. Williams went on to state that between 300 and 400 men were employed in the colliery, and that the defendant, as the certificated manager, had the daily control and manage-ment of it. He explained at length the general system of the ventilation of the colliery, and the condition in which it was found by the assistant inspector. Having pointed out that Mr. Chubb had already been fined 10*l.* by the magistrates for his first violation of a rule, he argued that there was also a distinct failure to comply with the second rule in question. He admitted that it was not the duty of the manager to make the entry personally, but he contended that it was clearly his duty to ensure that those under his direction made it. These were regulations provided by the Act of Parliament which were of the highest importance to the individual collier, who otherwise might not be able to judge of the state of the mine. The same argument applied with respect to the third allegation. There might, Mr. Williams added, be special circumstances under which the overman might neglect his duty, and the manager might not be aware that the danger existed; but in this case Mr. Chubb was perfectly aware of the accumulation of gas. He also submitted that the conviction in the first instance was sufficient to warrant the cancelling or suspension of the manager's certificate.

"The Commissioner observed that to justify such a decision it must be proved that the manager was unfit to discharge his duty, apart from any such previous conviction.

"Mr. Simons urged that the effect of the magisterial inquiry and the present one could not be made cumulative, and that the simple question the court had to consider was whether there had been negligence and incompetence or not. He also submitted that as Chubb had already appeared before the magistrates with respect to the second allegation and they had dismissed the case, it was not competent to have a reinvestigation of the charge. He contended that when a matter was considered by a competent tribunal and disposed of it could not be re-opened. Mr. Simons added that, with respect to the last charge, he contended that the responsibility of his client on that score was reflective. It was an offence of omission, and he did not know how his client could enforce a rule where the overman had committed a negative offence. How could Chubb take means to withdraw the men when the offence was perfected before he knew of it.

"The Commissioner said that argument was on the assumption that it was a sudden discovery, but he would take a note of the objection.

"Mr. Williams then called witnesses in support of the allegations.

"Mr. William Galloway, Assistant Inspector of Mines for the South Wales District, deposed to being acquainted with the Dinas mine, and described its various workings and the system of ventilation. Upon his visit on the 14th of June he entered the 2 ft. 9 in. seam with a Clanny lamp, and on getting to the 'William Moore's' heading found at first a small cavity containing a little explosive gas. On going farther on he found a larger cavity, and was about to raise his lamp up to see whether it contained gas, when Chubb, who accompanied him, cautioned him not to do so lest his light should be put out. He examined the cavity carefully, and found that it contained explosive gas in a stratum 12 in. thick at one end and 2 ft. at the other. The cavity was about 5 ft. wide and 20 ft. long. The gas was about 4½ feet from the floor. It was the principal outlet for the workmen from that part of the colliery, and for the coal, so that there was passing and repassing continually. The effect of this traffic would be that the gas would be liable to be dislodged and drawn downwards. There was no practical difficulty in clearing this place, and if the mine had been properly ventilated it should have been free. On returning to the down-cast shaft, and going past the point where the fan was situated, Chubb told him he could not proceed further with the 'Clanny' lamp, which is put out when in the midst of noxious gas. A 'Davy' lamp was given to him, and they proceeded through the canvas partition to the face of the heading, and as they passed along Chubb told him to keep down his lamp, and he at once discovered they were in explosive gas. About half way towards the face they met a man conducting a horse and tram. The driver had no light at all. Witness asked Chubb the reason of this, and he replied that it would not be safe to let the man carry a lamp. At the face of the heading he found two or three men at work. The air at this point was also explosive. He examined the air coming along the wooden air pipe from the fan, and found it contained a considerable quantity of gas, but still it was not explosive at the mouth of the pipe. He then requested Chubb to put out the lights and withdraw the men. They groped their way out in the dark until they reached the fresh air again. The explosive gas was continuous all the way. Chubb told him he had experienced great difficulty with this place for some time. Witness considered that this state of things must have existed from the time when the heading reached the point where the canvas partition was. It would take several months to drive the heading this distance. This portion of the mine was not fit for men to work in. It was highly dangerous. There was no other way for the men to pass except through the explosive gas. There was no difficulty in ventilating this part of the mine to render it quite free from gas if proper means had been employed. Witness asked Chubb why he had allowed it to get into this state, and he said he had been much troubled with it. Witness suggested that if he further contracted the entrance to the 2 ft. 9 in. seam he would improve the state of the air, and Chubb said he was afraid of interfering with the ventilation of the 6 ft. seam. Witness cautioned him on no account to allow the men to go beyond the canvas partition until the working was cleared of the gas. On a subsequent visit the defendant told witness that the workings were cleared, and the men were able to return to work. If an explosion had taken place the machinery in the shaft and the pit head gearing would have been destroyed, so that egress and ingress to the pit would have been prevented, and probably the men would have been all killed. On the 25th of June, when witness again visited the mine, he examined the report books, and on going through them found no entry whatever as to this accumulation of gas in the 2 ft. 9 in. heading. (Report book produced.) He had seen larger accumulations of explosive gas in mines, but had never seen men working in it. He certainly thought that the men should have been withdrawn.

"By Mr. Simons: At the time of his visit Chubb told him that he had given orders to put up a canvas cloth, which would have been an effectual expedient to clear away the gas. The driving of the heading from the 22 yards pit and the downcast pit would have improved the general ventilation of the mine, and he understood that the opening was completed a day or two after his visit. He had not found any disinclination on the part of Mr. Chubb or the proprietors of the colliery to abide by any advice he had given. In respect to the 2 ft. 9 in. heading, the ventilation generally was adequate, but not properly distributed. It was quite practicable to keep a mine free from gas. He remembered the second charge against Chubb of not recording the condition of the mine before the magistrates being dismissed. The overman was, however, convicted of it.

"Re-examined by Mr. Williams: There were no difficulties in the ventilation of the mine which a competent or careful manager could not easily have overcome. It was simply a question of expense.

"By the Commissioner: It was to save the expense of enlarging the wooden air-pipes that the ventilation was not completed. The neglect was, in witness's opinion, owing partly to a want of knowledge on the part of Chubb, and partly to a desire to get through as cheaply as possible.

"Mr. T. E. Wales, Government Inspector of Mines for the South Wales District, was the next witness. He said the Dinas Colliery was within his district, and in consequence of the report made to him by Mr. Galloway on the 14th of June, he communicated with the Home Secretary, who directed the proceedings which were taken before the magistrates, whose decision was communicated to the Home Secretary, which resulted in the present inquiry. He had heard the evidence of Mr. Galloway, and, assuming his facts to be correct, he considered that there would have been no difficulty in removing the gas. In such a state of things it was very dangerous for the men to be at work. He had never known men permitted to work when there was such a large accumulation of gas, and he did not think they should have been allowed to do so in this case. Considering the surrounding circumstances the accumulation of gas must, in his opinion, have been of long standing, and during the time the opening between the heading and six feet seam was being made there would not have been any difficulty in keeping the heading clear from gas.

"By Mr. Simons: The clearing away of gas would, to some extent, have devolved on the overman if it had come suddenly, but, if it had come gradually, it was the duty of the manager to see to its removal. The scheme that was being carried out would, no doubt, improve the ventilation. He was aware that Chubb had been under manager at the Dinas Colliery for many years, and his reputation, so far as he (Mr. Wales) was aware, had been that of a skilful and careful man.

"Re-examined: He considered that the means resorted to for the clearing away of the gas were very imperfect.

"By the Commissioner: A 'blower' might go on for weeks or months, but care would, in ordinary cases, be taken that the gas did not accumulate, and this should be done by proper ventilation. The mode adopted to get rid of the gas in the Polka seam was very defective, and had the gas exploded it would have been attended with very serious results.

"Mr. John Stockwood, clerk to the magistrates for the Pontypridd district, proved the conviction of Chubb in August last of a violation of the mining regulations. Two other summonses had been taken out against him, one was adjourned and the other was dismissed.

"This was the case for the promoters of the inquiry.

"Mr. Simons, addressing the Court for the defence, said there was no one who felt more keenly than his client the importance of such inquiries as these to colliery owners as well as those employed by them. Mr. Chubb, as was shown by the certificate which had been handed in, was a man of great experience in colliery operations, but he maintained that though he, as the manager of the colliery, was responsible for the effective working of it, there was a large amount of detail in carrying out the arrangements which must of necessity be left to the under-manager and to the overmen of the colliery. At the Dinas Pit he had the charge of from 400 to 500 men, and it was impossible that he could have more than a supervising eye and a controlling hand over the plans. To show Mr. Chubb's anxiety to get over the difficulty of ventilation, he would point to the fact that he had devised the heading in question between the two pits, and the ventilation was greatly improved. The fact that Mr. Wales and his deputy had been satisfied with what had been done was indicated by their not having thought it necessary to visit the mine since August. In opening headings of this kind there was always a danger of a sudden accumulation of gas, but he maintained that there was no evidence in this case that the accumulation was of long standing. That was only an assumption on the part of Mr. Galloway, but it was a point upon which a conclusion must not be jumped at. Though Mr. Chubb regretted there should have been any cause of complaint, it was significant that the magisterial view of the charge first brought against him was such that they had only mulct him in a fine of 10*l.* instead of the full penalty of 20*l.* And, with regard to the allegation that he was aware of the accumulation of gas before the visit of the Inspector on the 14th, he maintained that there was no proof of this, though the Crown might, if so disposed, have easily brought forward witnesses to testify to it. No act of Mr. Chubb's could have prevented the overman neglecting to record such a fact, nor could he by any means whatever be held responsible for the non-withdrawal of the men. It was quite unreasonable, and not contemplated by the statute, that the manager could be held responsible under such circumstances as these. With regard to the second complaint laid before the magistrates, he urged that it, having been since dealt with and dismissed, could not be revived, while for the first offence he had been punished. In conclusion, he urged that, as in any case it was evident that at least Mr. Chubb was not recklessly negligent, he was not deserving of the punishment it was now sought to inflict upon him.

"Messrs. Daniel John and Edmund Thomas, colliery proprietors in the county, were called, and gave Mr. Chubb a high character as an experienced and careful man at his work.

"No further evidence was offered for the defence.

"The Commissioner, after consulting with the assessor, gave an exhaustive review of the case in recording the decision of the Court. In the first instance, he referred to the points of law raised by Mr. Simons, whose arguments with respect to the finding of the magistrates in the two cases against Mr. Chubb, which they disposed of, the Court considered inconsistent. The simple duty that the Court had to discharge was to ascertain whether Mr. Chubb was or was not, either by reason of incompetence or gross negligence, or of his having been convicted of an offence against the Act, unfit to discharge his duty. With regard to the first allegation, it was clear that Mr. Chubb, being manager, was responsible for the proper ventilation of the mine. According to the evidence it was clear that he had not complied with the first General Rule, and, as no evidence had been offered in explanation of the circumstances sworn to (the Court could not accept the inferences made by Mr. Simons) they must find him guilty on that charge. There was no refutation of the statement that if an explosion had taken place in the state the mine was found by the Inspector not only would there probably have been a great destruction of property, but also the loss of many lives. Therefore the Court could but conclude that Mr. Chubb had been guilty of a very serious offence. According to the evidence of the two Inspectors, the mine must have been in an unsafe state for some time, and Mr. Chubb must have been aware of it, and as he had failed to see that a proper record of the fact was made by his subordinates, he had undoubtedly violated the second rule also. As to the third charge, the fact that the overman had neglected his duty by not removing the men from the dangerous workings was no excuse for Mr. Chubb neglecting his duty, and the Court, finding him guilty on each of the three charges, must order a suspension of his certificate for six months—the lightest possible punishment being inflicted in consideration of his good character.

"Mr. Williams did not press for costs."

"THE CHARGE AGAINST A COLLIERY MANAGER AT SWANSEA.

"The Certificate Suspended.

"The inquiry instituted by the Home Secretary into the conduct of Evan Foster, manager of the Ystradfawr Colliery, Ystradgynlais, was continued at the Guildhall, Swansea, on Saturday, before Mr. H. C. Rothery, the Commissioner appointed to make the inquiry, assisted by Mr. Thomas Cadman, Inspector of Mines for the South-West District, as assessor.

"Mr. C. H. Glascodine appeared for the Home Office, and Mr. W. Robinson Smith defended Mr. Foster.

"Mr. T. E. Wales, Her Majesty's Inspector of Mines for South Wales, was called, and stated that he had received notice of an explosion which took place at the Ystradfawr Colliery in September last. He visited the pit on the 9th, and then found some gas there in Bowen's level. He spoke to Mr. Foster about it, but that gentleman did not think he was called upon to clear away the gas, because Bowen's level was not then in work. The quantity of air which passed through the pit was 15,000 to 16,000 cubic feet per minute, and of that probably only 8,000 feet would be diverted into Bowen's level where the gas accumulated. The air which passed through that level, and the airway leading thereto, was wholly insufficient. Mr. Wales then explained how the pit was ventilated, and pointed out that the accumulated gas could easily be removed.

"Mr. Smith then ably addressed the Court, and argued that Mr. Foster had done all that he thought it was necessary; that he had been diligent and attentive in the discharge of his duties, and that there had been no wilful neglect. He had endeavoured to the best of his ability to do his duty as manager of the Ystradfawr Colliery.

"Mr. Glascodine also addressed the Court, after which an adjournment took place.

"The learned Commissioner, on the reassembling of the court, very ably explained the working of the pit, and the means of ventilation which were adopted. He also referred to a legal question which had arisen during the case. Mr Glascodine wished to put in the depositions which were taken before the magistrates of Ystradgynlais when Mr. Foster was charged there with a breach of the 1st and 2nd General Rules of the Mines Regulation Act of 1872, and fines werei mposed. Mr. Smith objected to the deposition being put in, and he (the Commissioner) upheld the objection. Any statement made by Mr. Foster before the magistrates or anywhere else, and properly sworn to, might be received, but the depositions unsupported by oath could not be put in evidence. After he had given at great length the arrangements for ventilating the pit, &c., the learned Commissioner said:—Then these questions would arise—Was Mr. Foster justified in allowing the accumulation of gas to continue in Bowen's level as he did for five or six weeks? Had he the means of getting rid of the gas? Was he justified in allowing the men to work with naked lights in such close proximity to this gas? As regarded the third point, there could be no question that Mr. Foster was not justified in allowing the men to work with naked lights with almost a certainty—he would not say a probability—that at some time or other the gas would be ignited, and those who were employed in the pit would be either killed or injured. As regarded the getting rid of the gas, Mr. Wales had explained very clearly to the Court with what facility it could have been disposed of. It was a very simple process, and would have been effectual for the purpose. If that process had been adopted, all the air which passed under the existing arrangements during the day from Bowen's level through the airway, would instead of that have passed through the adit and the face of the level, and would have carried away all the gas into the airway. Mr. Foster could not pretend to be ignorant of this accumulation of gas. Indeed, his advocate admitted that he was cognizant of it, and therefore Mr. Foster had shown either very great incompetency or gross negligence in not having taken some such means as those pointed out by Mr. Wales for the purpose of getting rid of the gas. The Court thought, therefore, that the first charge against the defendant was fully established. He could not, however, pass over that part of the case without referring to the terms of the notice which, by the Act of Parliament, the defendant was compelled to send to the Inspector of mines for the district. In stating in that notice the character of the accident of the 6th of September, Mr. Foster describes it as a slight explosion of gas in the roof of a level heading where men were timbering under a piece of ground that had fallen down to the height of about ten feet from the floor. The obvious intention of Mr. Foster in sending that statement was to induce the inspector, as he induced Mr. Lloyd Davis, the manager, to think that the explosion of gas arose from a portion of the roof having then and there fallen, by which an escape of gas had suddenly taken place, and not that it had arisen from an explosion of gas which had been allowed to accumulate in the mine for a space of something like six weeks at least. Mr. Foster had shown in that respect a want of fairness and honesty which the Court would have been very glad to have seen absent from the case. The second charge against Mr. Foster was that on the 9th of September, and on days immediately preceding, although inflammable gas had been found in the mine within the preceding 12 months, he neglected to enter or cause to be entered a report to the effect in a book kept for that purpose at the mine, contrary to the second General Rule of the 51st section of the Coal Mines Regulation Act of 1872. It was certainly true that the duty of keeping that report book fell upon the fireman, but for what purpose was it kept? Assuredly for the information of the manager, and for the information of the Inspector when he visited the colliery. In looking at that book he found that, from the 9th of September back as far as the 24th of July, the only observation which the fireman made was 'Safe,' and sometimes he believed it was 'All safe.' On the 24th of July a fall of roof occurred in the north-east heading, and that, he presumed, was the fall which had caused the suspension of work in David Bowen's level. On the 9th of September Mr. Wales having received the notice of which he (the Commissioner) had spoken, proceeded to visit the mine, and although he found on entering the pit a report signed by Thomas Bowen, the fireman, certifying that all was safe, he discovered when he entered Bowen's level

that there was a quantity of gas there; and this, be it remembered, was at 10 o'clock in the morning, after a current of air—such as it was—had been allowed to run during the night round the face of David Bowen's level, and to carry away such portion of gas as it could. Mr. Wales called the attention of the manager to the presence of gas at this place, and he observed that he did not think he was called upon to report it, because the heading did not form a portion of the present workings. The Commissioner then referred to a case against Humphrey and Brough, where it was held that it was not enough to ventilate the working places, travelling roads, &c., but it was necessary to ventilate such places as would render the working places dangerous in the event of an accumulation of gas. It was of no use for Mr. Foster to say that he was not bound to keep Bowen's level clear, because there was no working there. After this and down to some time in October, there were entries in the fireman's report book to the effect that gas was found in Bowen's level. It was not pretended that Mr. Foster was ignorant of this gas. All that was said was that he did not think it necessary to report it, and that, further, the report book was kept by the fireman, and not by the manager. If the report, however, was made for the benefit of the manager, it was his duty to see that the reports were entered correctly. If the fireman stated that which was not true it was the duty of the manager to inquire into the matter. The third charge is that in June last several explosions occurred in the mine attended with personal injury to those employed therein, and the defendant neglected to report the same to the Inspector of mines for the district, contrary to the 39th section of the Act. The Court had heard the evidence of a boy named William Watkins, who said that whilst working in the mine some time in June last he was burnt about the head by an explosion, that he left the pit immediately, and that at the top he saw Mr. Foster and showed him where he had been burnt. Mr. Smith had contended that William Watkins's evidence was not to be believed, but he (the Commissioner) failed to see why it should be disbelieved. If the statement were untrue Mr. Foster might have been called to deny it, and to prove that he had never seen the injuries which Watkins received, or that Watkins had spoken to him about them, but Mr. Foster had not been called for the purpose and the charge remained simply upon the evidence of William Watkins. The Court could see no reason to doubt his statement. A man named Howell Johnson had told them that on the 21st of June last, whilst he was at work in the mine, an explosion took place, and he was burnt. He went on to say that he left the work at once, and was away eight or nine days. It was true that Howell Johnson had not pretended that he had told Mr. Foster or Bowen, the fireman, of the injuries which he received, but he was away from his work and Mr. Foster must surely have known that he was absent. He had not told the Court that he had made any inquiry about the absence of Johnson, and it was clear that he knew he was away from his work. On the day after the accident Johnson sent to the colliery for oil. That stood undenied, and the Court must, therefore, conclude that there had been two explosions, at any rate, in the month of June, and it was not even pretended that these explosions were reported. Nor could they allow Mr. Evan Foster to escape on the assumption that the injuries sustained by William Watkins and Johnson were too trifling to need report, for the Act of Parliament distinctly laid down that where any personal injury was caused to a person in or about a mine by reason of an explosion, it was the duty of the manager to report the circumstances to the Inspector for the district. It was also his duty to report when a 'serious' injury was caused in any other way than by an explosion. There was a distinct difference between an explosion by gas and an injury caused in any other way. In the first case, where any person was injured a report must be made; and, in the second case, that is only necessary where serious injury is caused. There was no doubt, therefore, that Mr. Foster had violated the 39th section. The fourth charge was that on the 6th of September and the days immediately preceding and succeeding that date, although the mine was, by reason of obnoxious gases, dangerous and unsafe, he (Mr. Foster) did neglect to prevent persons entering the mine until the danger had been removed and the mine was in safety, contrary to the 40th sub-rule. It was proved that Owen Owens and William Watkins were at work within a few yards of the spot where the gas was accumulated, other men were allowed to work in the airway and to pass within three or four yards of the gas, and these were matters for which there was no justification whatever. It was Mr. Foster's duty to have suspended all operations in that part of the mine until the gas had been removed, and he could have removed it without difficulty. It was very improper on Mr. Foster's part to have allowed the men to work with naked lights under these circumstances, and if there had been any necessary duties to perform the men should have been furnished with safety lamps. It had been argued that the sub-rule 40 applied to firemen, and that the removal of these men was a duty incumbent upon the fireman, but how could that possibly be? Mr. Foster knew of the employment of these men at that particular spot, and knowing also as he did of the accumulation of gas, it was his duty to give orders to the fireman to remove the men, and not allow them to work there again until the gas had been removed. With regard to the two first offences, Mr. Foster had been proceeded against upon them before the Ystradgynlais magistrates, on the 4th of November last, and was fined 2*l.* 10*s.* in each case. Those convictions were not denied. It therefore only remained for that Court to say what, under the circumstances, it ought to do in regard to Mr. Foster. Notwithstanding what had been said by Mr. Smith, they could not forget that the lives of many people were in the hands of Mr. Foster, and the Act of Parliament said that the Court should cancel or suspend the certificate of a manager if they found that he was, not only by reason of gross negligence, but by reason of incompetency, unfit to discharge his duty. The Court considered that there had been in the present case either gross negligence or incompetency. If Mr. Evan Foster knew the danger to which he was exposing the lives of his workmen by allowing the accumulated gas to remain in David Bowen's level, and allowing the men to work there, he was guilty of gross negligence. If, on the contrary, he did not anticipate any danger from it, he had shown gross incompetency. It seemed to the Court that he could not in either case be allowed to shield himself under the excuse that he

had done what he did to the best of his ability, but that his ability was very little. Taking into consideration all the circumstances of the case, and also the high character that Mr. Foster had received from Mr. Wales, as having been, so far as he (Mr. Wales) had been able to see, a prudent, careful, and efficient officer, the Court would, instead of cancelling his certificate as they might otherwise be disposed to do, suspend it for the space of six calendar months.

"Mr. Glascodine applied for costs, which the learned Commissioner refused to allow."

General Remarks.

During the year five serious accidents have occurred, viz., a boiler explosion causing the loss of three lives, which happened on the 5th of March. I do not, however, consider it necessary to further comment on this case. The next took place at the Western Moor Colliery, Neath, causing the loss of four lives. It is not, however, my opinion that any of the officials or workmen were to blame for this, which was purely accidental and could not be foreseen.

The third was an explosion of gas in the Dunraven Colliery, through the firing of a shot, causing the loss of two lives. This explosion and consequent loss of life were, in my opinion, attributable to the system of firing shots where safety lamps were in use, and to the carelessness of the shot-firer or fireman in not properly examining the place for gas before firing the shot. I have repeatedly stated that in working the fiery steam coals of this district, shot-firing ought to be strictly prohibited. Another explosion occurred in the Marine Rhondda Colliery from the same cause, resulting in the loss of one life. As already stated, the manager in this case was summoned and fined 10*l.* and costs.

As the result of every year's working tends to convince me more and more of the danger attending such a system of working, I beg again to strongly advise the owners, agents, and managers to discontinue shot-firing in all our steam coal or fiery collieries.

The fourth was caused by an explosion of gas, by which two brothers lost their lives in one of the Plymouth Collieries. This was clearly brought about by some one having neglected to shut an air-door.

The fifth, which resulted in the loss of two lives, was, in my opinion, due to the special rules not having been properly carried out.

It will thus be seen that out of the seven lives lost by explosions of gas, not less than six were brought about by carelessness.

Ventilation.

The application of mechanical, namely, fan instead of furnace, ventilation continues, I am happy to say, to increase throughout the district. As the collieries in this district are now being worked at a much greater depth, some reaching from 500 to 700 yards from the surface, the question of ventilation is becoming, if possible, of greater importance than ever.

I consider the great and principal advantage attending fan in lieu of furnace ventilation, and especially in opening out new and fiery collieries, as is pre-eminently the case in this district at the present time, is that it prevents the possibility of an explosion of gas at the furnace. I find, however, that in some of our collieries the safety attending such a system of ventilation is entirely neutralised by having the return air (which in a fiery mine must naturally be charged to a greater or less extent with explosive gas) coming out and along one of the principal levels or thoroughfares to the bottom of the upcast shaft, where, generally speaking, open lights are in use. This system of ventilation cannot be too strongly condemned, and by proper forethought in opening out a new colliery, even where it is intended to draw coals up the upcast shaft, may and ought to be avoided. Where both the upcast and downcast shafts are used for drawing coals, they in reality constitute two collieries, and each ought to have its own "intake" and "return" airways, the latter communicating with the upcast shaft at a point considerably above the bottom of that shaft.

I am glad to be able to report that No. 30 General Rule is being more generally carried out, although still not nearly to the extent it ought to be. The reason assigned by the colliers for not availing themselves of it is that they are not paid by the owners for such inspections; and the owners say if they were to pay for such inspections it would destroy their value and utility. With reference to the circular letter $\frac{7}{6}\frac{4}{5}\frac{5}{5}\frac{3}{5}\frac{7}{5}$ of 10th December last, I beg respectfully to state that your general instructions have been complied with, and that during the year all fatal accidents, non-fatal explosions, and such other serious accidents as

required it, have been personally investigated either by myself or assistant. Besides these inspections several both casual and in consequence of anonymous letters have been made. These inspections, in accordance with your instructions, were made without sending notice of such to the owners or managers.

Total number of days on duty, by self and assistant, was - - - - -	593
Total number of days spent in underground and surface inspections by self and assistant - - - - - - - - - - - - - - -	532
Total number of days, engaged on sundry business, such as attending inquests, police courts, meetings in London, &c., &c. - - - - - - - -	61

I have the honour to be,
Sir,
Your most obedient Servant,
THOS. E. WALES.

The Right Honourable R. A. Cross, M.P.,
Home Secretary, Home Office,
Whitehall, London.

Report of Assistant Inspector.

SIR, Cardiff, 28th March 1879.

I HAVE the honour of reporting to you that during the past year I have discharged the duties of an Inspector of Mines in the South Wales District, where I have acted as assistant to and under the directions of Mr. Wales, the principal Inspector of the district.

I have the honour to be,
Sir,
Your most obedient Servant,
W. GALLOWAY.

The Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Office.

Collieries in the South Wales Inspection District, 1878.

No.	Names of Collieries.	Names of Owners.	Manager.	Post Town.	County.
1	Aberdare Merthyr Steam Coal Colliery.	Aberdare Merthyr Steam Coal Colliery Co., Limited.	Rees Price	Hirwain	Glamorganshire.
2	Lower Resolven	Attenburgh and May	Wm. Pickrell	Lower Resolven	Ditto.
3	Aberdare	Aberdare Coal Co.	D. Williams	Aberdare	Ditto.
4	Amman	Amman Iron Co.	W. Smith	Brynamman, R.S.O.	Ditto.
5	Bute	Aberdare Rhondda Co.	T. Evans	Hirwain	Ditto.
6	Four Feet Level	Ditto	Ditto	Ditto	Ditto.
7	Aber Rhondda	Aber Rhondda Coal Co.	Isaac Davis	Porth	Ditto.
8	Saron Level	Aberdare Plymouth Co., Limited	John Jenkins	Merthyr Tydfil	Ditto.
9	Blacks Level	Ditto	Howell Davis	Ditto	Ditto.
10	No. 2 Roadside	Ditto	Ditto	Ditto	Ditto.
11	Main Level	Ditto	Ditto	Ditto	Ditto.
12	Original	Ditto	Ditto	Ditto	Ditto.
13	Taibach	Ditto	John Jenkins	Ditto	Ditto.
14	No. 2 South	Ditto	Ditto	Ditto	Ditto.
15	No. 2 Clynmil	Ditto	Howel Davis	Ditto	Ditto.
16	Bwllfa No. 3 Level	Ditto	D. J. Simpson	Pontypridd	Ditto.
17	Blanant and Abergorki	Ditto	Hughes	Aberdare	Ditto.
18	Clay Patch Level	Ditto	Ditto	Ditto	Ditto.
19	Cwmbach	Ditto	Ditto	Ditto	Ditto.
20	Tunnel	Ditto	Ditto	Ditto	Ditto.
21	River Level	Ditto	Ditto	Ditto	Ditto.
22	No. 2 Pit	Ditto	Ditto	Ditto	Ditto.
23	Braich-y-Cymmer	Braich-y-Cymmer Coal Co.	H. Harries	Bridgend	Ditto.
24	Bodringallt	D. Davis and Sons	E. Edwards	Ystrad Rhondda	Ditto.
25	Cwmaman	Bevan Rees	R. Bevan	Aberdare	Ditto.
26	Barrow	Barrow Hæmatite Steel Co., Limited	Wm. Kellet	Bridgend	Ditto.
27	Broadoak	Broadoak Colliery Co.	N. Thubron	Loughor	Ditto.
28	Rocks Level	T. W. Booker & Co., Limited	E. D. Howell	Cardiff	Ditto.
29	Graig-y-Alt	Ditto	Ditto	Ditto	Ditto.
30	Llan	Ditto	Ditto	Ditto	Ditto.
31	Merthyr Dare	Bwllfa and Merthyr Dare Colliery Co., Limited.	Rees Llewellyn	Aberdare	Ditto.
32	Bwllfa Dare	Ditto	Ditto	Ditto	Ditto.
33	Cefn Merthyr	Bwllfa Colliery Co., Limited	Thos. J. Evans	Hirwain	Ditto.
34	Bute Merthyr	Bute, Marquis of	Thos. Curnew	Treherbert	Ditto.
35	Tewgoed	Byass, R. B., & Co.	G. Thomas	Taibach	Ditto.
36	Tynewidd Bayden	Barrow, James	J. Barrow	Maesteg	Ditto.
37	Bishwell	Bishwell Coal and Coke Co., Limited	W. Morris	Gower Road	Ditto.
38	Brynna Groynnon	Brynna Coal and Steel Co.	T. Price	Bridgend	Ditto.

Collieries in the South Wales Inspection District—*continued.*

No.	Names of Collieries.	Names of Owners.	Manager.	Post Town.	County.
39	Lletty Shenkin	Burnyeat, Brown, & Co.	L. Llewellyn	Aberdare	Glamorganshire.
40	Abergorchi Pit	Ditto	T. Williams	Pontypridd	Ditto.
41	Abergorchi Level	Ditto	Ditto	Ditto	Ditto.
42	Cefn Merthyr	Bwllfa Colliery Co.	T. J. Evans	Hirwain	Ditto.
43	Bryndu	Bryndu Coal & Coke Co.	Gwillym David	Bridgend	Ditto.
44	Cefn	Ditto	L. Morgan	Ditto	Ditto.
45	Birch Rock	Birch Rock Coal Co.	Thos. Rees	Pontardulais, R.S.O.	Ditto.
46	Birch Grove and Sisters' Pit	Birch Grove Coal Co.	J. Rowland	Swansea	Ditto.
47	Tophill	Cartwright, W. S.	L. Watkins	Pontypridd	Ditto.
48	Cribbwr Main	Cribbwr Main Coal and Coke Co.	D. Ellis	Bridgend	Ditto.
49	Pentre	Cardiff & Swansea Co.	W. James	Pontypridd	Ditto.
	Church	Ditto	Ditto	Ditto	Ditto.
50	Resolven	Ditto	J. Thomas	Resolven	Ditto.
51	Clay Level (Cyfartha)	Crawshay, R. T	M. Bates	Merthyr Tydfil	Ditto.
52	No. 2, Cethin	Ditto	Ditto	Ditto	Ditto.
53	Castle Pit	Ditto	Ditto	Ditto	Ditto.
54	Cwm Pit	Ditto	Ditto	Ditto	Ditto.
55	Coedcae	Coedcae Coal Co.	Wm. Davies	Pontypridd	Ditto.
56	Ynisfaio	Cope & Co.	E. D. Evans	Treherbert	Ditto.
57	Graig Slant	Cwmfelin Tin Plate Co.	Wm. Morgan	Swansea	Ditto.
58	Mansel	Ditto	Ditto	Ditto	Ditto.
59	Graig Pit	Ditto	Ditto	Ditto	Ditto.
60	Cwmaman	Cwmaman Coal Co.	Griff Thomas	Aberdare	Ditto.
61	Dinas No. 2 Level	Coffin & Co.	Samuel Hughes	Pontypridd	Ditto.
62	„ Lower Pit	Ditto	Ditto	Ditto	Ditto.
63	„ Middle Pit	Ditto	Ditto	Ditto	Ditto.
64	„ No. 3 Level	Ditto	Ditto	Ditto	Ditto.
65	Corrwg Fechan	Corrwg Fechan Colliery Co.	H. H. Young	Glyncorrwg	Ditto.
66	Cymmer	Cymmer Colliery Co.	Thos. Griffiths	Pontypridd	Ditto.
67	Dinas Isha	Dinas Isha Co.	Dl. Thomas	Punygraig	Ditto.
68	Duffryn Rhondda	Duffryn Rhondda Coal Co.	Chas. F. Hulett	Maesteg	Ditto.
69	Dinas Main No. 2 Seam	Dinas Main Coal and Coke Co.	T. Jones	Llantrissant	Ditto.
70	„ No. 3 Seam	Ditto	Ditto	Ditto	Ditto.
71	Dunraven Adare	Dunraven Adare Colleries, Limited	Chas. Elt	Glynneath	Ditto.
72	Ferndale, No. 2 Pit	Davis, D., & Sons	W. Thomas	Pontypridd	Ditto.
73	„ No. 4 Pit	Ditto	W. Rosser	Ditto	Ditto.
74	Abercwmboy	Ditto	E. Adams	Mountain Ash	Ditto.
75	Blaengwaur	Ditto	D. Evans	Aberdare	Ditto.
76	Ferndale, No. 1 Pit	Ditto	J. Meredith	Ferndale	Ditto.
77	Ocean, Eastern Pit	Davies, D., & Co.	J. Rees	Pontypridd	Ditto.

Collieries in the South Wales Inspection District—*continued.*

No.	Name of Collieries.	Names of Owners.	Manager.	Post Town.	County.
78	Ocean, Western Pit	Davies, D. and Co.	J. Owen	Pontypridd	Glamorganshire.
79	„ Maindy Pit	Ditto	J. Ray	Ditto	Ditto.
80	„ Dare Pit	Ditto	R. Reynolds	Ditto	Ditto.
81	„ Pare Pit	Ditto	D. Einon	Ditto	Ditto.
82	Maesteg Merthyr	Davis, William	W. Williams	Maesteg	Ditto.
83	Court Herbert	Dynevor Coal Co.	J. Graham	Neath	Ditto.
84	Bryndowe Level	Ditto	J. Williams	Ditto	Ditto.
85	Duffryn Main	Ditto	J. Hodgson	Ditto	Ditto.
86	Old Brithdir	Ditto	Wm. Hopkins	Ditto	Ditto.
87	Cwmdu	Ditto	Ditto	Ditto	Ditto.
88	West Brithdir	Ditto	Ditto	Ditto	Ditto.
89	Dowlais and Penydarran	Dowlais Iron Co.	Geo. Martin	Dowlais	Ditto.
90	Bargoed Longwork	Ditto	M. Truran	Ditto	Ditto.
91	Bedlinog	Ditto	Ditto	Ditto	Ditto.
92	Colly Levels	Ditto	W. Lintern	Ditto	Ditto.
93	Mountain 4 Feet Pit	Ditto	T. Phillips	Ditto	Ditto.
94	South Tunnel	Ditto	Ditto	Ditto	Ditto.
95	North Tunnel	Ditto	Ditto	Ditto	Ditto.
96	Black Vein Drifts and Level	Ditto	D. Evans	Ditto	Ditto.
97	No. 1 Penydarran	Ditto	Ditto	Ditto	Ditto.
98	No. 2 „	Ditto	Ditto	Ditto	Ditto.
99	Bargoed Big Coal Pit	Ditto	Ditto	Ditto	Ditto.
100	No. 2 Vochriw	Ditto	T. Bevan	Ditto	Ditto.
101	No. 1 „	Ditto	Ditto	Ditto	Ditto.
102	Rhyding	Evans and Bevan	T. Jenkins	Neath	Ditto.
103	Ellin	Ditto	Ditto	Ditto	Ditto.
104	Tor Cefn	Ditto	Ditto	Ditto	Ditto.
105	Crynant	Ditto	Ditto	Ditto	Ditto.
106	Brynteg	Ditto	Ditto	Ditto	Ditto.
107	Seven Sisters	Ditto	Ditto	Ditto	Ditto.
108	Bryn Morgan	Essery, W. H.	W. Williams	Gwys Swansea Valley	Ditto.
109	Emily	Emily Colliery Co.	E. Maddock	Llansamlet	Ditto.
110	Marine Rhondda	Fowler's Pontypridd Steam Coal Co.	W. Rosser	Pontypridd	Ditto.
111	Blaenclydach	Forest Iron and Steel Co., Limited	E. Richards	Tonypandy	Ditto.
112	Ffaldau	Ffaldau Steam Coal Co.	Ed. Plummer	Bridgend	Ditto.
113	Avon	Sir Daniel Gooch, Bart., M.P.; L. L. Dillwyn, Esq., M.P.; and Richard Basset, Esq.	J. G. Morris	Maesteg	Ditto.
114	Glyncorrwg	Glyncorrwg Colliery Co., Limited	Ed. Plummer	Glyncorrwg	Ditto.
115	Perthyglisson	Griffiths, R. T.	J. Morgan	Troedyrhiw	Ditto.

No.	Names of Collieries.	Names of Owners.	Manager.	Post Town.	County.
116	Great Western	Great Western Colliery Co., Limited	T. Harrison	Pontypridd	Glamorganshire.
117	Cilely	Great Western Railway Co.	J. P. Williams	Llantrissant	Ditto.
118	Grovesend	Grovesend Colliery Co.	Hy. Edmund	Pontardulais, R.S.O.	Ditto.
119	Oakwood Slant and Levels	Governor and Co.'s Successors	R. Jenkins	Cwmavon	Ditto.
120	Finery Slant and Levels	Ditto	Ditto	Ditto	Ditto.
121	Llwynypia, No. 2 Pit	Glamorgan Coal Co., Limited	Joshua Davies	Pontypridd	Ditto.
122	„ No. 3 Pit	Ditto	Ditto	Ditto	Ditto.
123	Gilfach No. 1 Drift	Ditto	R. Williams	Bridgend	Ditto.
124	„ No 1 Level	Ditto	Ditto	Ditto	Ditto.
125	„ No. 1 Pit	Ditto	Ditto	Ditto	Ditto.
126	Penrhiwfer Level (No. 2 Coal)	Ditto	Wm. Stewart	Pontypridd	Ditto.
127	„ Pit (No. 3 Coal)	Ditto	Ditto	Ditto	Ditto.
128	„ Steam Coal Pits	Ditto	Ditto	Ditto	Ditto.
129	Baglan	Grenfell & Sons	John Walter	Briton Ferry	Ditto.
130	Werfa	Heath, Evens, & Co.	D. Thomas	Aberdare	Ditto.
131	Harris Navigation	Harris Navigation Coal Co., Limited	Brown and Adams	Quakers Yard, Pontypridd	Ditto.
132	Gwndwn Cadi		S. Hill	Clydach	Ditto.
133	Llynvi Valley	Humby, James	W. Rees	Bridgend	Ditto.
134	Hendreforgan	Hendreforgan Colliery Co., Limited	J. Walters	Ystalyfera	Ditto.
135	South Level	Hopkins, Thomas	T. Hopkins	Hirwain	Ditto.
136	Ynishir (No. 2 Coal)	Jones, Thomas	J. Jones	Porth	Ditto.
137	Jones Navigation	Ditto	Thomas Jones	Pontypridd	Ditto.
138	Cwmllynfell	James and Aubrey	J. Hay	Ystalyfera	Ditto.
139	Dunraven Merthyr	Joseph, Thomas	M. Llewellyn	Treherbert	Ditto.
140	Nantmelyn	Jones, Mordecai	W. T. Bedlington	Aberdare	Ditto.
141	Gorllwyn Level	Ditto	Ditto	Ditto	Ditto.
142	Torwmsynydd	Jenkins, D., and Sons	W. Richards	Briton Ferry	Ditto.
143	New Cymmer	Joseph, David	D. Jones	Pontypridd	Ditto.
144	Bedllwyn	Kenway and Sons	T. L. Thomas	Aberdare	Ditto.
145	Llest	Llest Coal Co.	W. Jones	Pontypridd	Ditto.
146	North Llantwit	Llantwit Coal Co.	J. Hale	Llantrissant	Ditto.
147	Bontnewydd	Lewis, William	W. Lewis	Pontypridd	Ditto.
148	Llanmorlais	Llanmorlais Coal and Coke Co., Limited	W. Harries	Penclawdd, R.S.O.	Ditto.
149	Mardy	Locket's Merthyr Steam Coal Co., Lmtd.	J. Salathiel	Ferndale, Pontypridd	Ditto.
150	Mynydd-Bach-y-Glo	Landore Tin Plate Co.	W. Davies	Waunarlwydd, Swansea	Ditto.
151	Lanelay	Loftus Iron Co., Limited	Ditto	Llantrissant	Ditto.
152	Tyrisaf	Lewis, John	J. Lewis	Pontardulais, R.S.O.	Ditto.
153	Gwern	Llansamlet Coal Co.	T. Lowther	Morriston, R.S.O.	Ditto.
154	Aberdulais	Lewis, James	J. Thomas	Glynneath	Ditto.
155	Danygraig	Lambert, Charles, & Co.	J. Phillips	Swansea	Ditto.

Collieries in the South Wales Inspection District—*continued.*

No.	Names of Collieries.	Names of Owners.	Manager.	Post Town.	County.
156	North Dunraven	London and South Wales Coal Co., Lmtd.	D. Gibbon	Treherbert	Glamorganshire.
157	Ditto Graig Level	Ditto	Ditto	Ditto	Ditto.
158	Tywith	Llynvi, Tondû, and Ogmore Coal and Iron Co., Limited.	W. Snowdon	Maesteg	Ditto.
159	Garn Wen	Ditto	Ditto	Ditto	Ditto.
160	No. 9 Colliery	Ditto	J. Formblyn	Ditto	Ditto.
161	No. 11 Maesteg	Ditto	Wm. Snowdon	Ditto	Ditto.
162	Maesteg Deep	Ditto	Ditto	Ditto	Ditto.
163	Park Slip	Ditto	D. Jones	Bridgend	Ditto.
164	Wyndham	Ditto	Jas. Jones	Ditto	Ditto.
165	Cwmdû	Ditto	J. Formblyn	Maesteg	Ditto.
166	Tynewydd	Ditto	J. C. Williams	Bridgend	Ditto.
167	Caedu	Ditto	Ditto	Ditto	Ditto.
168	Duffryn	Ditto	W. Snowdon	Maesteg	Ditto.
169	Bryn Coch	Morgan, David	Edward Lewis	Cardiff	Ditto.
170	Furnace Bloom	Morgan and Jones	E. Lewis	Caerphilly	Ditto.
171	Rhydwain	Morgan, John	W. Davis	Aberdare	Ditto.
172	Maes-y-Marchog	Maes-y-Marchog Colliery Co.	None	Swansea	Ditto.
173	Mwrwg Vale	Mwrwg Vale Steam Coal Co.	J. Harris	Llanelly	Ditto.
174	Neath Merthyr	Neath Merthyr Colliery Co.	M. Thomas	Resolven	Ditto.
175	Merthyr Vale	Nixon, Taylor, and Cory	Geo. Brown	Troedyrhiw	Ditto.
176	Navigation	Ditto	W. Bevan	Mountain Ash	Ditto.
177	Deep Duffryn	Ditto	Ditto	Ditto	Ditto.
178	Forest Level	Ditto	Ditto	Ditto	Ditto.
179	Fforchaman	Powell Duffryn Coal Co.	Rees Rees	Aberdare	Ditto.
180	Cwmneol	Ditto	L. Evans	Ditto	Ditto.
181	Aberman, Graig Level	Ditto	J. Sanderson	Ditto	Ditto.
182	Aberaman	Ditto	Ditto	Ditto	Ditto.
183	Treaman	Ditto	J. Griffith	Ditto	Ditto.
184	Abergwaur	Ditto	Ditto	Ditto	Ditto.
185	Cwmdare	Ditto	R. Snape	Ditto	Ditto.
186	High Duffryn	Ditto	J. Griffith	Ditto	Ditto.
187	Old Duffryn	Ditto	J. Evans	Ditto	Ditto.
188	Middle Duffryn	Ditto	J. Watson	Mountain Ash	Ditto.
189	Upper Pit, Lower Duffryn	Ditto	J. Havard	Ditto	Ditto.
190	Lower Pit, Lower Duffryn	Ditto	Ditto	Ditto	Ditto.
191	Gelligaer	Powell's Gelligaer Coal Co., Limited	R. Griffiths	Pontypridd	Ditto.
192	Llancaiach	Ditto	W. Brace	Ditto	Ditto.
193	Penwillia	Penwillia Coal Co.	D. Matthews	Swansea	Ditto.
194	Cefn Golan	Pearce, J. W.	A. L. Pearce	Ditto	Ditto.

Collieries in the South Wales Inspection District—*continued.*

No.	Names of Collieries.	Names of Owners.	Manager.	Post Town.	County.
195	Pwllcarn	Pwllcarn Colliery Co.	D. Davis	Bridgend	Glamorganshire.
196	Penrhiwceiber Navigation	Penrhiwceiber Navigation Coal Co.	Wm. Bevan	Mountain Ash	Ditto.
197	Primrose	Primrose Coal Co.	J. Ray	Pontardawe	Ditto.
198	Penygraig (No. 3 Coal)	Penygraig Coal Co.	R. Rowlands	Pontypridd	Ditto.
199	Ditto (No. 2 Coal)	Ditto	Ditto	Ditto	Ditto.
200	Cwmclydach	Perch and Co.	E. Stephens	Pontypridd	Ditto.
201	Rhondda Merthyr	Rhondda Merthyr Steam Coal Co.	J. Rosser	Treherbert	Ditto.
202	Rhondda Merthyr Abergorchi Level.	Rhondda Merthyr Coal Co.	Ditto	Ditto	Ditto.
203	Llan Darran Dhu	Rasser and Caslett	A. Caslett	Pontypridd	Ditto.
204	Rhondda Mountain	Rhondda Mountain Coal Co.	W. Tom	Glynneath	Ditto.
205	Penrhiw	Rees, Phillip	P. Rees	Ditto	Ditto.
206	Weig	Rees, D. H.	T. Hopkins	Swansea	Ditto.
207	Rhydydefed	Richard, Phillip	Phillip Richard	Ditto	Ditto.
208	Gorwydd	Sterry, Executors of the late A.	J. Hughes	Ditto	Ditto.
209	Mountain	Ditto	H. Davis	Ditto	Ditto.
210	Gelly	Thomas and Griffiths	D. Thomas	Pentre	Ditto.
211	Tynybedw	Ditto	T. Salathiel	Ditto	Ditto.
212	Tynewydd	Troedyrhiw Coal Co.	J. J. Thomas	Porth	Ditto.
213	Tylchafach	Tylchafach Coal Co.	H. Begg	Llantrissant	Ditto.
214	Tylacoch	Tylacoch Steam Coal Co., Limited	T. G. Davis	Treorky	Ditto.
215	Typica	Typica Coal Co., Limited	J. Daniels	Pontypridd	Ditto.
216	Cefn Elas	Thomas, T. L.	T. L. Thomas	Merthyr Tydfil	Ditto.
217	Tylors	Tylor and Co.	D. Matthews	Pontypridd	Ditto.
218	Ynishir (Steam Coal)	Thomas, J.	Z. Thomas	Porth	Ditto.
219	Llwynrhidia	Thomas, Joseph	E. Jones	Cwmaman, R.S.O.	Ditto.
220	Ithrim	Thomas and Rees	J. L. Rees	Swansea Valley	Ditto.
221	Clydach Vale	Thomas, Riches, and Co.	Ed. Hayhurst	Pontypridd	Ditto.
222	Sguborwen	Thomas, S.	Ditto	Aberdare	Ditto.
223	Llwyncelyn	Ed. Thomas	J. Edwards	Pontypridd	Ditto.
224	Dinas Isha	Thomas, Daniel	Daniel Thomas	Penygraig	Ditto.
225	Dwrllas	Thomas, M. S., and Co.	W. Thomas	Penclawdd	Ditto.
226	Tydraw	Thomas and Beddows	J. Beddows	Swansea	Ditto.
227	Pwllgwaun	Thomas, D.	G. Cousins	Pontypridd	Ditto.
228	Brynwillach	Vivian, H. H., Esq., M.P.	E. R. Daniel	Swansea	Ditto.
229	Cathelid	Vivian and Sons	Jas. Naysmith	Ditto	Ditto.
230	Mynydd Newydd	Ditto	J. Williams	Ditto	Ditto.
231	Pentrefelin	Ditto	J. Harris	Ditto	Ditto.
232	Pentre	Ditto	E. Richard	Ditto	Ditto.
233	Goitre	Ditto	T. Gray	Taibach	Ditto.

Collieries in the South Wales Inspection District—*continued.*

No.	Names of Collieries.	Names of Owners.	Manager.	Post Town.	County.
234	Morfa	Vivian and Sons	T. Gray	Taibach	Glamorganshire.
235	Aberpergwm	Williams, M. S.	Allison, T. B.	Glynneath	Ditto.
236	Gadlys	Waynes Merthyr Colliery, Limited	Wm. Thomas	Aberdare	Ditto.
237	Fernhill	Watkinson and Sons, Geo., Limited	Jno. Tudor	Treherbert	Ditto.
238	Wenallt Merthyr	West Rhondda Coal and Coke Co.	M. Raymond	Neath	Ditto.
239	West Rhondda	Ditto	Ditto	Ditto	Ditto.
240	Worcester	Worcester Coal Co.	B. Thomas	Swansea	Ditto.
241	Cwmbach	Ditto	J. Davies	Ditto	Ditto.
242	Nantgarw Llantwit	Williams, Wm., and Co.	J. Williams	Taffs Well	Ditto.
243	Western Merthyr	Western Merthyr Co., Limited	Wm. P. George	Clydach	Ditto.
244	Ffoes	Williams, Wm.	Wm. Williams	Bridgend	Ditto.
245	Prosper Level	Ditto	Ditto	Hirwain	Ditto.
246	Tower Graig	Ditto	Ditto	Ditto	Ditto.
247	Ystrad Isha		J. W. Bhissen	Swansea	Ditto.
248	Ynysawdre	Ynysawdre Coal, Coke, and Brick Co., Ld.	R. Bates	Bridgend	Ditto.
249	Eilwen	Ystalyfera Iron Co.	R. C. Fisher	Ystalyfera	Ditto.
250	Feeder Drift	Ditto	Ditto	Ditto	Ditto.
251	Cyfing	Ditto	Ditto	Ditto	Ditto.
1	Dynant	Dynant Colliery Co.	S. Davis	Pontyberem	Carmarthenshire.
2	Middle Amman	Davis and Phillips	D. Davies	Cwmaman, R.S.O.	Ditto.
3	Clossisa	Jones and Harry	J. Harry	Llanelly	Ditto.
4	Brynllor	Jones, Rees, and Sons	R. Jones	Cwmaman	Ditto.
5	Gwaun Cae Gurwen	Gwaun Cae Gurwen Coal Co.	D. Meredith	Llanelly	Ditto.
6	Gors-y-Garnant	Garnant Colliery Co.	R. Clark		Ditto.
7	Garnant Pit	Ditto	Ditto		Ditto.
8	Llangennech	Llangennech Coal Co., Limited	T. Horrobin	Llanelly	Ditto.
9	Cawdor	Morgan and Thompson	R. Phillips	Cwmaman, R.S.O.	Ditto.
10	Talyclyn	Masters, W.	W. White	Pontardulais, R.S.O.	Ditto.
11	Pool	Mason & Elkington	J. Thomas	Burry Port, R.S.O.	Ditto.
12	Cwm Capel	Ditto	Ditto	Ditto	Ditto.
13	Capel Ifan	Ditto	Ditto	Ditto	Ditto.
14	Tyllwyd	Newman and Smith	D. Thomas	Cwmaman, R.S.O.	Ditto.
15	Bryn Gwyn	Neville and Druce	W. Williams	Llanelly	Ditto.
16	Cae	Ditto	Ditto	Ditto	Ditto.
17	Glyned	Ditto	Ditto	Ditto	Ditto.

No.	Names of Collieries.	Names of Owners.	Manager.	Post Town.	County.
18	Old Castle and Bres	Neville and Druce	W. Williams	Llanelly	Carmarthernshire.
19	Pencoed	Ditto	Ditto	Ditto	Ditto.
20	California	Norton and Co.	T. Davies	Llandebil	Ditto.
21	Cross Hands	Ditto	Ditto	Llanelly	Ditto.
22	Gilfach	Ditto	Ditto	Llandebil	Ditto.
23	Pontyberem, Five Quarter Pit	Pontyberem Colliery Co., Limited	T. Seymour	Llanelly	Ditto.
24	Pontyberem, South Pit	Ditto	Ditto	Ditto	Ditto.
25	Raven	Raven Coal Co.	D. Hughes	Ditto	Ditto.
26	Plasbach	Roberts and Evans	D. Rosser	Kidwelly	Ditto.
27	Rhos	Rhos Coal Co.	O. Rees	Pantytrynon	Ditto.
28	Maesardofen	Rees, W.	T. Williams	Llanelly	Ditto.
29	New Lodge	Thompson, Wise, and Co.	T. Seymour	Ditto	Ditto.
30	Trimsaran	Trimsaran Colliery Co., Limited	L. Williams	Kidwelly	Ditto.
31	Cabad	Thomas, Wm.	J. Protheroe	Llanelly	Ditto.
32	Llwyupandy	Williams and Harry	T. Williams	Ditto	Ditto.
33	Carway	Yelverton, Hon. W. H.	S. O. Hands	Kidwelly, R.S.O.	Ditto.
1	Gilfach	David, Wm.	W. David	Ystalyfera	Breconshire.
2	Ystradgunlais and Swansea	Ystradgunlais and Swansea Co., Limited	T. Lloyd Davis	Ditto	Ditto.
3	Gwain Clawdd	Ystalyfera Iron Co.	R. C. Fisher	Ditto	Ditto.
1	Woodland	Canton and Roberts	D. Canton	Haverfordwest	Pembrokeshire.
2	Market Gate	Jeffreston Anthracite Coal Co., Limited	T. Stokes	Tenby	Ditto.
3	Moreton	Saundersfoot and Tenby Collieries Co., Ltd.	R. Fry	Saundersfoot	Ditto.
4	Southwood	Walters and Canton	D. Canton	Notton Haven	Ditto.
5	Hook	Powell	J. Wilson	Haverfordwest	Ditto.

METALLIFEROUS MINES.

SIR, Swansea, 29th March 1879.

As Inspector under the Metalliferous Mines Act for this district I have the honour to report that during the year ended December 31st, 1878, there were seven mines at work employing 402 persons underground and 223 on the surface.

The produce of the mines has been as follows :—

	Tons	cwt.	qrs.
Glamorganshire, Iron Ore	53,053	18	0
Ditto, Ochre	300	6	0
Ditto, Lead Ore	42	6	0
Carmarthenshire, Lead Ore	574	0	0
Pembrokeshire, Lead Ore	550	5	0
Total tons raised	54,520	15	0

During the year one life was lost by a fall of roof in the Trecastle Mine.

Metalliferous Mines in South Wales District.

No.	Name of Metalliferous Mine.	Name of Owners.	Post Town.	County.
1	Mwyndy Iron Ore Mine	Mwyndy Iron Ore Co.	Llantrissant	Glamorgan.
2	Garth Iron Ore Mine	T. U. Booker & Co., Lim.	Cardiff	Ditto.
3	Bute Iron Ore Mines	Dowlais Iron Co.	Llantrissant for Works, Dowlais for the Co.	Ditto.
4	Llan Gan Lead Mine	Llan Gan Lead Mine Co.	Cowbridge	Ditto.
5	Trecastle, Llanharry	Mwyndy Iron Ore Co.	Llantrissant	Ditto.
6	Llanfyrnach Lead Mines	Llanfyrnach Lead Mining Co.	Llanfyrnach Lead Mines, R.S.O.	Pembroke.
7	Nant-y-Mwyn Lead Mine	Nant-y-Mwyn Lead Mining Co.	Llandovery	Carmarthen.

During the year 1877, 573 were employed with an output of 78,422 tons of minerals.

It will be observed that there is an increase of 52 persons employed, but a decrease of no less than 23,901¼ tons of minerals raised, as compared with 1877.

I have the honour to be,
Sir,
Your most obedient Servant,
THOS. E. WALES.

The Right Honourable R. A. Cross, M.P.,
Home Secretary, Home Office,
Whitehall, London.

LIST of the FATAL COLLIERY ACCIDENTS, and Loss of LIFE arising therefrom, in the portion of Mr. THOS. E. WALES' DISTRICT, consisting of Part of GLAMORGANSHIRE, Part of BRECONSHIRE, CARMARTHENSHIRE, and PEMBROKESHIRE, during the year 1878.

Date.	No. of Accidents.	Name of Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Jan. 1	1	Taibach Pit	Merthyr Tydvil	Plymouth Iron Co.	Thos. Richard	Collier	23	Killed by fall of roof	–	1	–	–	–
„ 4	2	No. 1 Pit	Aberdare	Aberdare Coal Co.	Hy. Williams	Collier	40	Killed by fall of roof	–	1	–	–	–
„ 8	2	Aberdare Merthyr.	Aberdare	Aberdare Merthyr Steam Coal Co., Lim.	Geo. Bryant	Labourer	35	Killed on surface whilst attempting to get into moving trams.	–	–	–	–	1
„ 18	4	Cwm Neol	Aberdare	Powell's Duffryn Steam Coal Co.	Thos. Evans	Collier	42	Killed by trams on engine plane	–	–	–	1	–
„ 18	5	Dwrllas	Penclawdd	Penclawdd Tin Plate Co.	John Morris	Collier	55	Killed by a fall of roof	–	1	–	–	–
„ 24	6	Navigation	Aberdare	Nixon, Taylor, and Cory	Thos. Hitchings	Door-boy	14	Killed by full trams drawn by a horse.	–	–	–	1	–
„ 24	7	Colly	Merthyr Tydvil	Dowlais Iron Co.	Richard Thomas	Collier	17	Killed by fall of clod above coal	–	1	–	–	–
Feb. 1	8	Navigation	Aberdare	Nixon, Taylor and Cory	Danl. Thomas	Haulier	19	Killed by trams on engine plane	–	–	–	1	–
„ 5	9	Weigfach	Swansea	J. Glassbrook and Sons	Thos. Davies	Repairer	45	Killed by trams on engine plane	–	–	–	1	–
„ 8	10	Gadlys	Aberdare	Gadlys Coal and Iron Co.	Morris Evans	Haulier	14	Killed by trams drawn by horse	–	–	–	1	–
„ 11	11	Werfa	Aberdare	Heath and Evens	Edwd. Parker	Collier	20	Killed by fall of coal	–	1	–	–	–
„ 23	12	No. 7 Pit	Dowlais	Dowlais Iron Co.	Howell Emanuel	Collier	14	Killed by fall of roof	–	1	–	–	–
„ 24	13	Harris's Navigation.	Quakers Yard	Harris's Navigation Coal Co., Lim.	John Howells	Sinker	35	Killed by pump-rods falling down shaft.	–	–	1	–	–
„ 26	14	Main	Neath	Dynevor United Collieries Co. Lim.	David Davies John John	Collier Collier	27 46	Killed by overwinding	–	–	2	–	–
„ 27	15	Ferndale	Pontypridd	D. Davis and Sons	Joseph Thomas	Collier	27	Killed by fall of roof	–	1	–	–	–
„ 27	16	Ynisfaio	Treherbert	Troedyrhiw Coal Co.	J. R. Davies	Collier	55	Killed by fall of coal	–	1	–	–	–
Mar. 5	17	Ynisfaio	Pontypridd	Troedyrhiw Coal Co.	John Rees David	Collier	45	Killed by a fall of roof	–	1	–	–	–
„ 5	18	Callands	Swansea	Vivian and Sons	T. Griffiths Dd. Jones Dd. Fisher	Engineer Stoker Not employed.	53 19 13	Killed by a boiler explosion	–	–	–	–	3

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives Lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Mar. 7	19	Vochriw No. 2	Dowlais - -	Dowlais Iron Co. - -	Samuel Beynon -	Hitcher -	41	Killed by fall of coal from ascending cage.	–	–	1	–	–
„ 9	20	Maerdy - -	Pontypridd -	Locket's Merthyr Steam Coal Co., Lim.	Thomas Jones -	Sinker -	27	Killed by fall of fireclay from side of shaft.	–	–	1	–	–
„ 13	21	Old Duffryn -	Aberdare -	Powell's Duffryn Steam Coal Co., Lim.	James Williams -	Collier -	39	Killed by fall of coal - -	–	1	–	–	–
„ 14	22	Tynybedw -	Pontypridd -	Thomas and Griffiths -	Rees Jones -	Collier -	39	Killed by fall of roof - -	–	1	–	–	–
„ 20	23	Ferndale No. 4	Pontypridd -	D. Davis and Sons -	David Jones -	Collier -	18	Killed by falling out of cage whilst ascending.	–	–	1	–	–
„ 20	24	No. 2 Clinmil -	Merthyr Tydvil	Aberdare and Plymouth Coal Co. - -	Thomas Davies Hugh Davies -	Collier - 19 Collier - 13		Killed by an explosion of gas -	2	–	–	–	–
„ 21	25	Graig - -	Aberdare - -	Gadlys Iron Co. - -	Daniel Jones -	Collier -	25	Killed by a fall of coal - -	–	1	–	–	–
„ 22	26	Goitre - -	Taibach -	Vivian and Sons - -	John Rees -	Collier -	26	Killed by fall of roof - - -	–	1	–	–	–
„ 25	27	Dare - -	Pontypridd -	D. Davies and Co. -	Evan James -	Collier -	24	Killed by fall of roof - -	–	1	–	–	–
„ 27	28	Great Western	Pontypridd -	Great Western Colliery Co., Lim.	Edward Morgan	Collier -	62	Killed by fall of roof - - -	–	1	–	–	–
April 2	29	Seven Sisters -	Neath - -	Evans and Bevan -	Thomas Williams	Haulier -	13	Killed on surface by drum-chain -	–	–	–	–	1
„ 10	30	Eastern -	Pontypridd -	D. Davies and Co. -	Hopkin Jones -	Collier -	39	Killed by fall of coal - -	–	1	–	–	–
„ 10	31	Deep Duffryn -	Aberdare -	Nixon, Taylor, and Cory -	John Evans -	Collier -	58	Killed by fall of roof - - -	–	1	–	–	–
„ 15	32	Bute - -	Aberdare - -	Aberdare Rhondda Steam Coal Co., Lim.	Alex. Lewis -	Collier -	28	Suffocated by going into an accumulation of fire-damp by going beyond the danger and disobeying the order of the fireman.	–	–	–	1	–
„ 15	33	Westernmoor -	Neath - -	Westernmoor Colliery Co.	— Rees - -	Collier -	32	Killed by an inundation of water from old workings.	–	–	–	4	–
					— Williams -	Collier -	38						
					— Llewelyn -	Collier -	30						
					David Davies -	Collier -	14						
„ 16	34	Gwern -	Swansea - -	Llansamlet Coal Co. -	John Davies -	Carpenter	40	Killed at bottom of shaft - -	–	–	1	–	–

List of Fatal Colliery Accidents—*continued*.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives Lost. Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Apr. 24	35	No. 4 Tyra	Neath - -	Cardiff and Swansea Smokeless Steam Coal Co., Limited.	H. Harries -	Collier -	58	Killed by fall of roof - -	–	1	–	–	–
„ 27	36	Middle Duffryn	Aberdare - -	Powell's Duffryn Steam Coal Co., Lim.	Geo. Phillips -	Collier -	36	Killed by fall of coal - -	–	1	–	–	–
May 13	37	A. Tylor and Co.'s Collieries.	Pontypridd -	A. Tylor and Co. -	Benj. Williams -	Collier -	38	Killed on surface by falling out of waggon.	–	–	–	–	1
„ 16	38	Park - -	Pontypridd -	D. Davies and Co. - -	Richd. Morris -	Collier -	30	Killed by fall of roof - -	–	1	–	–	–
„ 16	39	Ynisymond -	Swansea - -	Cory, Yeo, and Co. - -	John Jenkins -	Overman	63	Killed by fall of roof - -	–	1	–	–	–
„ 18	40	No. 1 Pit -	Aberdare - -	Aberdare Coal Co. -	David Davies -	Collier -	32	Killed by fall of roof - - -	–	2	–	–	–
					Benj. Bowen -	Collier -	38						
„ 22	41	Barrow - -	Bridgend - -	Barrow Steel Co. - -	Thos. Evans -	Manager	27	Killed by overwinding - -	–	–	1	–	–
„ 30	42	Ynysfaio - -	Pontypridd -	Troedyrhiw Coal Co. -	John Lewis -	Haulier -	18	Killed by moving trams - -	–	–	–	1	–
„ 30	43	Bedlinog -	Merthyr Tydfil -	Dowlais Iron Co. -	John Prothero -	Sinker -	31	Killed by falling from walking stage.	–	–	1	–	–
„ 31	44	Gelli - -	Pontypridd -	Thomas and Griffiths -	John Morgan -	Sinker -	25	Killed whilst ascending shaft, the handle of the bucket breaking.	–	–	2	–	–
					Isaac Morris -	Sinker -	35						
June 1	45	No. 9 Pit -	Aberdare - -	Aberdare and Plymouth Coal Co.	Jonathan Jones -	Coal-trimmer.	54	Killed on surface by waggon passing over him.	–	–	–	–	1
„ 4	46	Tynybedw -	Pontypridd -	Thomas and Griffiths -	Thos. Jones -	Banksman	30	Killed by falling down shaft from lodge-room.	–	–	1	–	–
„ 6	47	No. 1 Vochriw	Dowlais - -	Dowlais Iron Co. - -	David Davies -	Timberer	63	Killed by fall of roof - -	–	1	–	–	–
„ 7	48	Tunnel - -	Aberdare - -	Aberdare and Plymouth Coal Co.	Richard Williams	Collier -	33	Killed by fall of roof - - -	–	1	–	–	–
„ 8	49	Dare - -	Pontypridd -	D. Davies and Co. - -	John Davies -	Collier -	14	Killed by fall of roof - - -	–	1	–	–	–
„ 8	50	Glanmorwg -	Llanelly - -	Lloyd and Son - -	Daniel Jones -	Collier -	28	Killed by fall of roof - -	–	2	–	–	–
					John Hall -	Collier -	32						

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives Lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
June 17	51	Cymmer -	Pontypridd -	Cymmer Colliery Co. -	Dd. Humphrey -	Collier -	32	Killed by fall of roof - -	–	1	–	–	–
„ 25	52	Bedlinog -	Dowlais -	Dowlais Iron Co. -	Robert Owens -	Sinker -	50	Killed by fall of stone from side of sinking shaft.	–	–	1	–	–
„ 25	53	Ynisher -	Pontypridd -	Ynishir Steam Coal Co. -	Thos. Parry -	Collier -	25	Killed by fall of coal - -	–	1	–	–	–
„ 26	54	Caedu - -	Bridgend -	Llynvi, Tondû, and Ogmore Valley Coal and Iron Co.	J. Jenkins -	Collier -	40	Killed by fall of roof - - -	–	1	–	–	–
July 1	55	No. 4 Pit -	Pontypridd -	D. Davies and Sons -	John Evans -	Haulier -	18	Killed by sliding down winding rope whilst in a state of intoxication.	–	–	1	–	–
„ 5	56	Clydach Vale -	Pontypridd -	Thomas and Riches -	Thos. James -	Timberman	25	Killed by fall of roof - -	–	1	–	–	–
„ 6	57	No. 4 Pit (Ferndale).	Pontypridd -	D. Davis and Sons -	David Price -	Collier -	24	Killed by fall of roof - -	–	1	–	–	–
„ 10	58	Nantmelyn -	Aberdare -	Mordecai Jones - -	John Bowen -	Labourer.	51	Killed by carriage whilst crossing pit bottom	–	–	–	1	–
„ 11	59	Morriston -	Swansea -	John Glassbrook - -	Evan Williams -	Door-boy	13	Killed by trams - - -	–	–	–	1	–
„ 15	60	Blaengwawr -	Aberdare -	D Dvis and Sons -	Morgan Rees -	Collier -	18	Killed by fall of coal - -	–	1	–	–	–
„ 15	61	Harris' Navigation.	Pontypridd -	Harris' Navigation Coal Co., Lim.	Henry Woodyatt	Sinker -	29	Killed by falling off water-barrel whilst descending shaft.	–	–	1	–	–
„ 16	62	South - -	Haverfordwest -	Dd. Thomas - -	David Thomas -	Collier -	40	Killed by fall of coal - -	–	1	–	–	–
„ 18	63	No. 1 Ferndale-	Pontypridd -	D. Davis and Sons -	James Webber -	Collier -	25	Killed by fall of roof - - -	–	1	–	–	–
„ 23	64	Southwood -	Haverfordwest -	Walters and Canton -	John Powell -	Collier -	15	Killed by fall of roof - -	–	1	–	–	–
„ 30	65	Parkslip - -	Bridgend -	Llynvi, Tondû, and Ogmore Coal and Iron Co.	James Hurley -	Labourer	42	Killed by trucks on surface - -	–	–	–	–	1
„ 31	66	Bute - -	Aberdare - -	Aberdare Rhondda Steam Coal Co., Lim.	Edward Rees -	Collier -	13	Killed by fall of coal - -	–	1	–	–	–
„ 31	67	Jone's Navigation.	Pontypridd -	Thos. Jones - -	William Bevan -	Collier -	27	Killed by fall of roof - -	–	1	–	–	–
Aug. 2	68	Rhondda Merthyr.	Pontypridd -	Rhondda Merthyr Coal Co.	Job Harding -	Hitcher -	25	Killed by pit-top gates falling on him	–	–	1	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives Lost.				
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Aug. 2	69	No. 2 South	Merthyr Tydvil	Aberdare and Plymouth Coal Co.	William Morris	Collier	29	Killed by fall of roof	–	1	–	–	–
„ 5	70	Penygraig	Pontypridd	Penygraig Coal Co.	Elias Evans	Collier	32	Killed by fall of roof	–	1	–	–	–
„ 7	71	Nantmelyn	Aberdare	Mordecai Jones	Robert Davis	Collier	17	Killed by fall of roof	–	1	–	–	–
„ 9	72	Fforchaman	Aberdare	Powell Duffryn Steam Coal Co., Lim.	Alf. Williams	Collier	13	Killed by fall of roof	–	1	–	–	–
„ 10	73	Ynysfaio	Pontypridd	Toedyrhiw Coal Co.	David Davies	Collier	18	Killed by fall of roof	–	1	–	–	–
„ 12	74	Gelli	Pontypridd	Thomas and Griffiths	Noah Llewellyn	Sinker	36	Killed by falling from walling stage into water.	–	–	1	–	–
„ 12	75	Dunraven	Pontypridd	Thomas, Joseph	George Howell Wm. Phillips	Collier Collier	27 34	Killed by an explosion of fire-damp	2	–	–	–	–
„ 16	76	No. 1 Vochriw	Dowlais	Dowlais Iron Co.	George Williams	Collier	15	Killed by an explosion of fire-damp	1	–	–	–	–
„ 16	77	Deep Duffryn	Aberdare	Nixon, Taylor, and Corry	John Buck	Collier	19	Killed by fall of roof	–	1	–	–	–
„ 21	78	Gellia	Neath	Evans and Bevan	Saml. Mellin	Collier	24	Killed by fall of clod	–	1	–	–	–
„ 22	79	Blaenclydach	Pontypridd	Forest Steel Co.	Thos. Walding	Sheaveman	64	Killed by trams on engine plane	–	–	–	1	–
„ 23	80	Old Duffryn	Aberdare	Powell Duffryn Steam Coal Co., Lim.	John Williams	Labourer	58	Killed by a fall of coal	–	1	–	–	–
„ 23	81	Park	Pontypridd	D. Davies and Co.	Evan Jones	Collier	55	Killed by fall of coal	–	1	–	–	–
Sept. 4	82	Marine Rhondda	Pontypridd	Marine Rhondda Steam Coal Co.	Daniel Jones	Collier	—	Killed by an explosion of gas	1	–	–	–	–
„ 3	83	Jones' Navigation.	Pontypridd	Thomas Jones	Evan Jones	Collier	58	Killed by fall of coal	–	1	–	–	–
„ 9	84	No. 11 Level	Maesteg	Llynvi, Tondu, and Ogmore Coal Co.	Evan Bevan	Collier	24	Killed by fall of stone	–	1	–	–	–
„ 10	85	Morfa	Taibach	Vivian and Sons	William Caple	Collier	19	Killed by fall of roof	–	1	–	–	–
„ 18	86	Dunraven Adare	Neath	Dunraven Adare Coal Co.	Wm. Powell	Collier	52	Killed by an explosion of gas	1	–	–	–	–
„ 25	87	Dwellas	Swansea	H. L. Morris and Co.	John Griffiths	Collier	40	Killed by trams on engine plane	–	–	–	1	–
„ 30	88	Old Castle	Llanelly	Nevill and Druce	John Bowen	Collier	32	Killed whilst ascending shaft by falling out of cradle.	–	–	1	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Oct. 5	89	Insole's Merthyr	Pontypridd -	Insole's Merthyr Steam Coal Co., Lim.	Thos. Kemp -	Door-boy	13	Killed by fall of roof - -	–	1	–	–	–
„ 10	90	Insole's Merthyr	Pontypridd -	Insole's Merthyr Steam Coal Co., Lim.	Caleb Evans -	Collier -	28	Killed by fall of roof - -	–	1	–	–	–
„ 15	91	Merthyr Dare -	Aberdare -	Bwllfa and Merthyr Dare Colliery Co., Lim.	David Davies -	Collier-boy	14	Killed by fall of coal - -	–	1	–	–	–
„ 17	92	Aberaman -	Aberdare -	Powell's Duffryn Steam Coal Co., Lim.	Robert Edwards	Collier -	32	Killed by fall of coal - -	–	1	–	–	–
„ 19	93	Gadlys - -	Aberdare -	Gadlys Coal and Iron Co.	John Harris -	Sinker -	48	Killed on surface by engine plane rope.	–	–	–	–	1
„ 20	94	Merthyr Vale -	Pontypridd -	Nixon, Taylor, and Cory	Wm. Griffiths -	Collier -	35	Killed by fall of roof - -	–	1	–	–	–
„ 21	95	Dyllas Drift -	Aberdare -	Gadlys Coal and Iron Co.	Wm. Jones -	Collier -	12	Killed by fall of coal -	–	1	–	–	–
Nov. 8	96	Bwllfa -	Aberdare -	Bwllfa and Merthyr Dare Colliery Co., Lim.	Morgan Rees -	Collier -	25	Killed by falling out of descending cage, the cage having got out of the guides - - -	–	–	3	–	–
					Thomas Rees -	Collier -	21						
					Edmund Davies	Haulier -	30						
„ 13	97	Llwynpia -	Pontypridd -	Glamorgan Coal Co. -	H. Banbury -	Greaser -	18	Killed by waggons on colliery siding	–	–	–	–	1
„ 19	98	Lower Duffryn	Aberdare -	Powell's Duffryn Steam Coal Co., Lim.	Richd. Cooney -	Haulier -	15	Killed by trams on surface - -	–	–	–	–	1
„ 25	99	Navigation -	Aberdare -	Nixon, Taylor, and Cory	Edwin Davies -	Stoker -	16	Killed by waggons on surface -	–	–	–	–	1
„ 26	100	Deep Duffryn -	Aberdare -	Nixon, Taylor, and Cory	Evan Bond -	Stoker -	22	Killed by waggons on surface -	–	–	–	–	1
„ 29	101	Merthyr Vale -	Pontypridd -	Nixon, Taylor, and Cory	James Lewis -	Haulier -	28	Killed by fall of roof - -	–	1	–	–	–
„ 29	102	No. 2 Penydarran	Dowlais -	Dowlais Iron Co. -	W. Davies -	Haulier -	18	Killed by falling under trams -	–	–	–	1	–
Dec. 2	103	Insole's Merthyr	Pontyprid -	Burnyeat, Brown, and Co.	John Roper -	Door-boy	—	Killed by falling under trams -	–	–	–	1	–
„ 12	104	Old Castle -	Llanelly	Nevill and Druce -	G. Phillips -	Collier -	43	Killed by fall of roof - -	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost. Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Dec. 16	105	Western -	Pontypridd -	Ocean Steam Coal Co. -	John Ashton -	Haulier's boy.	—	Killed by falling under trams -	–	–	–	1	–
„ 19	106	Llwynpia -	Pontypridd -	Glamorgan Coal Co. -	Evan Jones -	Scrunman	45	Killed by railway waggons -	–	–	–	–	1
„ 19	107	Llancaiach -	Pontypridd -	Powell's Gellygaer Coal Co.	Wm. Hughes -	Roadman	—	Killed by trams on inclined plane -	–	–	–	1	–
„ 19	108	Western -	Pontypridd -	D. Davies and Co. -	Evan Williams -	Collier -	19	Killed by fall of clod - -	–	1	–	–	–
„ 21	109	Insole's Merthyr	Pontypridd -	Burnyeat, Brown, and Co.	W. Harding -	Ripper -	36	Killed by fall of coal - - -	–	1	–	–	–
„ 27	110	Gadly's -	Aberdare -	Gadlys Coal and Iron Co.	John Harris -	Master Sinker	47	Killed by fall of stone from side of sinking shaft.	–	–	1	–	–
„ 30	111	No. 2 South -	Merthyr Tydvil	Plymouth Iron Co. -	John Thomas -	Collier -	37	Killed by fall of coal - -	–	1	–	–	–
								TOTAL - -	7	62	22	19	14

Mr. Wardell's Report.

REPORT on the WORKING of the COAL MINES REGULATION ACT, 1872 (35 & 36 Vict. c. 76.), in the YORKSHIRE and LINCOLNSHIRE DISTRICT, during the Year ended 31st December 1878.—By FRANK N. WARDELL, Esq., F.G.S.

SIR, Wath, near Rotherham, March 1879.

I HAVE the honour to submit to you my twelfth annual report as an Inspector of Mines, for the year ending 31st December 1878.

Seventy-seven accidents resulted in 81 deaths, there being only three accidents which occasioned loss of life to more than one person in each case.

The largest number of deaths from one of these accidents occurred at a small colliery near Barnsley, known as the "Flockton" or "Slack Hills" Colliery, and here three persons were suffocated by carbonic acid gas.

Two deaths were caused by overwinding and the partial failure of a detaching hook at the Waterloo and Woodlesford Co.'s Colliery, near Leeds.

A fall of coal at Messrs. Charlesworth's, Thrybergh Hall Colliery, near Rotherham, resulted in the deaths of two men.

The remaining 74 accidents caused the deaths of one person in each case.

Of the 81 deaths, 80 occurred in coal mines and one at an ironstone mine; and I am thankful to be able to point out that the number of accidents is less by 23 than in the previous year, and the deaths are diminished by 26.

The number of deashs during the year caused by explosions of gas was four, as compared with three in the year 1877. This increase is inconsiderable, and the number is so far satisfactory, as it enables me once again to state that no explosion has occurred, sweeping away a vast number at once, such as from time to time has to be recorded.

Under the head of "Deaths from falls of roof and sides," I am glad to be able to show a reduction in loss of life; the number so killed being 40 in 1878, whilst in the year before it was 59. With one exception, when the total was 37, this is the most favourable result as regards this prolific source of accident, for 12 years. Again, with reference to shaft accidents, the number of lives lost during this year was five. In the previous year the number was 19. This is a most satisfactory reduction, and so small a total has not hitherto been recorded under this head since my appointment.

The deaths from "Miscellaneous causes underground," however, I regret to say, show an increase of 11; the number being in 1878, 22, and in 1877, 11; that is to say, the total is doubled.

In the last column of the list, that representing accidents on the surface, the deaths in 1877 and 1878 were 15 and 10 respectively. Here, therefore, the amount is reduced by five. Still, the proportion is one-eighth of the whole mortality, and much too high.

I was prepared to expect a very considerable falling off in the amount of mineral raised during this year, but find that the actual decrease is only 182,663 tons. Trade has continued in a very depressed state, and, I regret to say, strikes have abounded, so that the total above quoted is somewhat surprising. The amount of mineral raised in this district during the year was 16,188,179 tons, compared with 16,370,842 tons in the year 1877.

This decrease is made up in the following way:—

Coal raised in 1877, 15,805,235 tons.
" " 1878, 15,582,283 "
A decrease of 222,952 tons.

Ironstone raised in 1877, 372,445 tons.
" " 1878, 419,807 "
An increase of 47,362 tons.

Fire-clay raised in 1877, 188,346 tons.
" " 1878, 174,865 "
A decrease of 13,481 tons.

Shale, &c. raised in 1877, 4,816 tons.
" " 1878, 11,224 "
An increase of 6,408 tons.

Or a total decrease of 182,663 tons.

The number of persons employed was 59,951, which gives a rate of production equal to 270 tons per person. In 1877 the proportion was 269 tons per person, or practically the same.

There is again a decrease in the number of persons employed to the extent of 826. In the year 1877 the amount of mineral produced in this district was 16,370,842 tons, the loss of life being 107, or a proportion of one death to every 152,999 tons raised. The total amount raised in the same time, in the kingdom, was 148,846,260 tons, and the number of deaths 1,208, giving a proportion of one death to every 123,217 tons raised.

During the past year the amount of mineral raised in this district was 16,188,179 tons, and the loss of life was 81, which gives a proportion of one death to every 199,854 tons raised. The total amount produced in the kingdom during the same time being 145,798,138 tons, with a loss of life amounting to 1,413, thus giving a proportion of one death to every 103,183 tons produced.

Certain tables and statistics which it has been my custom to include in my Report, and which have been found to afford interesting and useful information, are appended.

	1878.	1877.	Increase 1878.	Decrease 1878.
Total number of mines in the kingdom -	3,968	4,231	—	263
Average number of mines for each district -	331	353	—	22
Actual number of mines in Yorkshire and Lincolnshire.	525	543	—	18
Total number of persons employed in mines in the kingdom.	475,329	494,391	—	19,062
Average number of persons employed in mines for each district.	39,611	41,199	—	1,588
Actual number of persons employed in mines in Yorkshire and Lincolnshire.	59,951	60,777	—	826
Total amount of mineral produced in the kingdom.	145,798,138	148,846,260	—	3,048,122
Average amount of mineral produced for each district.	12,149,095	12,403,855	—	254,760
Actual amount of mineral produced in Yorkshire and Lincolnshire.	16,188,179	16,370,842	—	182,663

SUMMARY of separate Colliery Accidents in the Yorkshire and Lincolnshire District during the year ending 31st December 1878.

Explosions of fire-damp - - - - - -	4
Falls of roof and sides - - - - - -	39
In shafts - - - - - - - -	4
Miscellaneous underground - - - - -	20
On the surface - - - - - - -	10
Total - -	77

SUMMARY of Lives lost in the above Accidents.

Explosions of fire-damp - - - - - -	4
Falls of roof and sides - - - - - -	40
In shafts - - - - - - - -	5
Miscellaneous underground - - - - -	22
On the surface - - - - - - -	10
Total - -	81

Deaths from Shaft Accidents.

Overwinding	2
Falling into shaft from surface	1
Things falling from surface	1
Repairing conductor a few yards from bottom of shaft in cage, which fell with him, owing to slack rope	1
Total	5

Deaths from Miscellaneous Causes Underground.

Explosion of gunpowder	1
Suffocated by gases	4
On inclined planes	8
By trams and tubs	7
Fell into hot water in sump at a steam pump	1
Kicked by a horse	1
Total	22

Deaths on the Surface.

By machinery	1
Run over and crushed by waggons	6
Thumb trapped whilst filling dirt into waggon	1
Riding on step of locomotive which left the rails	1
Excavating for foundation, when portion of brick wall fell upon him	1
Total	10

Monthly Statement of Deaths caused by Accidents in the Mines of the Yorkshire and Lincolnshire District during the Year 1878.

Month.	Explosions.	Falls of Roof and Sides.	In Shafts.	Miscellaneous.	Above Ground.	Total.
January	—	6	—	4	—	10
February	—	4	—	—	—	4
March	1	3	—	3	1	8
April	—	2	—	1	3	6
May	—	2	—	2	1	5
June	—	3	—	1	—	4
July	—	4	1	2	—	7
August	1	2	—	3	2	8
September	—	1	—	1	—	2
October	1	4	—	2	—	7
November	—	4	4	2	3	13
December	1	5	—	1	—	7
Total	4	40	5	22	10	81

The following TABLE shows the DEATHS arising from VARIOUS CAUSES during the last 12 years.

Nature of Accident.	Deaths.												
	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total.
Explosions of fire-damp	1	6	1	11	10	45	12	30	162	3	3	4	288
Falls of roof and sides	41	36	41	46	42	43	52	49	62	37	59	40	548
In shafts	18	11	7	14	13	14	18	8	11	9	19	5	147
Miscellaneous underground	17	13	15	14	12	28	15	10	21	8	11	22	186
On the surface	13	14	5	5	7	3	18	15	11	14	15	10	130
Totals of lives lost	90	80	69	90	84	133	115	112	267	71	107	81	1,299
Totals of accidents	84	77	62	83	80	96	105	88	105	71	100	77	1,028

LIST of COLLIERIES where FATAL ACCIDENTS have occurred in the years 1868 to 1878 inclusive.

Owner's Name.	Name of Colliery.	Deaths.											
		1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total.
Earl Fitzwilliam	Elsecar Collieries	2	1	1	2	3	2	—	—	2	2	3	18
John Brown and Co.	Aldwarke Main	1	—	1	2	3	3	4	9	2	—	1	33
	Car House	2	1	1	3								
T. M. Carter and Co.	Allerton Bywater	2	1	—	—	1	—	—	—	—	—	—	4
Farnley Iron Co.	Farnley	3	—	—	—	1	2	—	—	—	1	—	7
Newton, Chambers, and Co.	Thorncliffe	1	1	4	4	2	3	2	3	4	2	1	27
Cliffe Coal and Fire Clay Co.	Hollingthorpe	1	—	1	—	1	—	—	—	—	—	—	3
Lundhill Coal Co.	Lundhill	1	—	2	1	4	1	1	2	2	2	1	17
Jeffcock and Dunn	Carbrook	1	1	—	—	—	—	—	—	—	—	—	2
J. and J. Charlesworth's Collieries		6	2	—	4	2	5	26	3	2	1	5	56
Isaac Wood and Son	Dean Lane and Harrop Edge	1	—	—	1	1	—	—	—	—	—	—	3
Sturges and Co.	New Gawber Hall	1	1	—	—	—	1	—	—	1	—	—	4
R. M. and Holmes Co.	Holmes	3	1	3	3	1	1	1	3	—	5	1	22
Thrybergh Hall Co.	Thrybergh Hall	1	—	—	—	—	—	—	—	—	—	—	1
B. Huntsman	Tinsley Park	3	4	5	1	—	—	2	4	2	2	1	24
Hird, Dawson, and Hardy	Low Moor	2	2	—	1	2	5	3	1	3	3	2	24
D. Wroe and Co.	Heckmondwike	2	—	—	1	—	—	—	—	—	—	—	3
	Waterloo												
New Sharlston Coal Co.	Sharlston	1	1	—	2	1	2	1	—	2	1	1	12
Rothervale Coal Co.	Fence	1	—	2	2	1	1	—	3	1	3	1	15
	Orgreave												
Greenhough and Co.	Adwalton	1	—	—	—	—	—	—	—	—	—	—	1
Charles Winn	Nostell	1	—	—	1	—	—	—	—	—	—	—	2
Monk Bretton Coal Co.	Monk Bretton	1	—	1	1	1	1	1	—	—	5	1	12
J. and J. Haigh	Victoria, Morley	1	—	2	—	—	—	—	—	—	1	1	5
Pope and Pearson	West Riding and Silkstone	1	2	1	1	4	4	—	2	1	—	1	17
Wombwell Main Co.	Wombwell Main	2	2	3	3	1	—	2	—	1	1	—	15
W. Ingham and Sons	Wortley	1	—	—	—	—	—	—	—	—	—	—	1
Edmunds and Swaithe Main Co.	Swaithe Main	1	1	1	1	2	1	3	146	—	—	1	159
	Edmund's Main	—	—	1	1								
Mitchell and Co.	Mitchell Main	—	—	—	—	—	—	—	—	—	1	—	1
R. Hudson and Co.	Stanley	2	2	—	1	—	2	2	6	—	5	3	23
Silkstone Fall Co.	Silkstone Fall	1	1	—	—	—	—	—	—	—	—	—	2
Joshua Bower and Sons	Allerton	3	—	—	—	3	1	1	—	—	3	—	11
Manston Coal Co.	Manston	2	2	—	1	1	1	—	—	1	—	—	8
Kiveton Park Coal Co.	Kiveton Park	1	1	—	2	3	1	3	2	3	—	—	16
Leather and Littlewood	Ellis Laith	1	—	—	—	—	—	—	—	—	—	—	1
Skinner and Holford	Waleswood	1	—	2	2	3	—	1	2	1	—	—	12
Bowling Iron Co.	Bowling	2	1	3	—	—	—	1	5	2	3	2	19
H. Briggs, Son, and Co.	Whitwood	1	—	2	—	2	6	3	10	1	4	1	30
A. Harding and Co.	Beeston Manor	1	1	—	—	1	—	—	—	—	—	—	3
J. Jackson	Great Gomersal	1	—	—	—	—	—	—	—	—	—	—	1
J. T. Leather	Waterloo Main	1	1	1	—	—	1	1	—	—	1	—	6
W. Ackroyd and Bros.	Morley Main	1	—	—	—	36	—	—	—	1	—	1	39

List of Collieries where Fatal Accidents have taken place—*continued.*

Owner's Name.	Name of Colliery.	Deaths.											
		1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total.
G. and J. Haigh	Ravensthorpe, Alverthorpe, Dewsbury Moor	2	—	1	1	1	1	1	2	—	—	2	11
Wharncliffe Silkstone Co.	Wharncliffe Silkstone	1	1	1	—	1	1	1	—	2	—	—	8
West Yorkshire Iron and Coal Co.	West Ardsley	1	1	1	1	1	1	2	3	2	—	1	14
E. Sutcliffe and Co.	Victoria	1	—	—	—	—	1	—	—	—	—	—	2
J. Baistow	Norwood Green	1	—	—	—	—	—	—	—	—	—	—	1
Blacker Main Co.	Blacker Main	2	1	2	—	1	—	1	1	—	2	—	10
G. Bailey	St. John's	1	—	—	1	—	—	1	—	1	—	—	4
Samuel Fox and Co.	Stocksbridge	1	—	—	—	1	—	—	—	—	—	—	2
Woolley Coal Co.	Woolley	1	3	2	2	—	4	1	—	—	—	2	15
Wells, Birch, Ryde, & Co.	Hoyland and Elsecar	1	—	—	1	1	—	—	1	—	1	1	6
Howley Park Co.	Howley Park	1	—	—	—	—	—	—	—	—	—	—	1
Locke and Co.	St. John's, Kippax	1	—	3	1	2	—	3	2	—	3	—	15
Staveley Coal and Iron Co.	North Staveley	1	—	—	—	1	1	—	1	—	—	—	4
Garforth Coal Co.	Garforth	1	1	—	1	—	2	—	—	2	—	—	7
Asquith Bros.	Howden Clough	1	—	—	—	1	1	—	—	—	—	1	4
W. Day	Mount Osborne	1	2	5	2	4	2	3	2	1	2	1	25
J. Rhodes	Woodthorpe	—	1	1	—	—	1	—	—	—	—	—	3
Pitsmoor Coal Co.	Brightside	—	2	1	—	—	5	—	2	—	—	—	10
G. A. Haworth and Co.	Silkstone Main	—	1	—	—	—	3	1	2	—	—	—	7
Norwegian Titanic Co.	Neville Hill	—	1	—	—	—	—	1	—	—	1	—	3
C. Cammell and Co.	Oaks	—	2	2	3	1	5	4	4	—	2	—	23
R. C. Clarke	Old Silkstone	—	1	—	—	—	—	2	1	—	—	—	4
Thorp's Gawber Hall Co.	Thorp's Gawber Hall	—	1	1	1	—	3	1	5	—	—	1	13
Darfield Main Co.	Darfield Main	—	3	3	1	2	1	1	4	—	—	—	15
Wheldale Coal Co.	Wheldale	—	1	—	2	—	2	2	3	3	—	1	14
R. Craik and Co.	East Gawber Hall	—	2	2	1	1	5	3	1	—	3	4	22
Seth, Senior, and Sons	Box Ings	—	1	—	—	—	—	—	—	—	—	—	1
Lodge, Webster, and Scott	Healey	—	1	—	—	—	—	—	—	—	—	—	1
G. Watkinson and Sons	Darton	—	1	—	—	—	—	—	—	—	—	—	1
Townend Bros.	Denholm	—	1	—	—	—	—	—	—	—	—	—	1
Denaby Main Co.	Denaby Main	—	3	4	2	5	1	2	—	1	1	1	20
Rhodes and Dalby	Snydale, Sykes, Prince of Wales	—	2	4	1	5	—	—	—	1	1	1	15
John Holmes	Churwell	—	1	—	—	—	—	—	—	—	—	—	1
Manvers Main Co.	Manvers Main	—	2	—	1	1	2	—	2	4	3	1	16
Stansfeld and Co.	Flockton	—	2	—	—	—	—	—	1	—	2	1	6
Haynes and Co.	Hall Royd	—	1	1	—	—	—	—	2	—	—	—	4
Strafford Main Co.	Strafford Main	—	—	1	1	1	—	—	1	2	1	—	7
Hargreaves and Naylor	Whinney Moor	—	—	1	—	—	—	—	—	—	—	1	2
Chas. Wheatley's Collieries	Bradley Wood, &c.	—	—	1	—	—	—	—	—	—	—	1	2
Hepworth Iron Co.	Wood	—	—	1	—	—	—	—	—	—	—	—	1
John Cawthera	Four Lane Ends	—	—	2	—	—	—	—	—	—	—	—	2
W. Wood	Foxholes	—	—	2	—	—	—	—	—	—	1	—	3
J. Marsland	Providence	—	—	1	—	—	—	—	—	—	—	—	1
Messrs. Greaves	White Hill	—	—	1	—	—	—	—	—	—	—	—	1
E. Heeley	Lane End	—	—	1	—	—	—	—	—	—	—	—	1
Chickenly Heath Co.	Chickenly Heath	—	—	1	—	—	—	—	—	2	—	—	3
Cooper, Sellars, and Co.	Roundwood	—	—	1	—	—	—	—	—	—	2	—	3
J. C. Ingham	Thornhill	—	—	1	2	—	1	—	—	—	2	—	6
Cooper and Co.	Worsbro' Park	—	—	1	—	4	—	—	—	2	—	—	7
Sellars and Co.	Greasbro'	—	—	1	—	—	—	—	—	1	—	—	2
York Road Coal and Iron Co.	Killingbeck	—	—	1	2	—	1	1	1	—	1	—	7
J. Sheard	Gregory Spring	—	—	1	—	—	—	—	1	—	—	—	2
W. Horn	West Scrafton	—	—	1	—	—	—	—	—	—	—	—	1
Middleton Coal Co.	Middleton	—	—	—	1	—	—	3	—	—	—	—	4
Trustees of H. Ellis	Kirkstyles	—	—	—	1	—	—	—	—	—	—	—	1
Marriott Brothers	Mirfield Moor	—	—	—	1	—	—	—	—	—	—	—	1
W. Ward	Churwell	—	—	—	1	—	—	—	—	—	—	—	1
Featherstone Main Co.	Featherstone Main	—	—	—	2	3	—	—	2	—	1	2	10
Crawshaw and Blakeley	Savile	—	—	—	1	—	1	—	—	—	—	—	2
High Stile Coal Co.	High Stile	—	—	—	1	—	—	2	—	—	—	—	3
Park Coal Co.	Liversedge	—	—	—	1	—	—	1	1	—	—	2	5
Hall and Stones	High Royd	—	—	—	1	—	1	—	1	—	—	—	3
Johnson and Co.	West Pit	—	—	—	1	—	—	—	—	—	—	—	1
G. Chambers and Son	Grange	—	—	—	2	1	—	1	—	—	—	—	4
T. A. Mann and Co.	Rockley	—	—	—	1	—	—	—	—	—	—	1	2
Duke of Norfolk	Nunnery	—	—	—	2	5	7	3	1	1	4	1	24

List of Collieries where Fatal Accidents have taken place—*continued.*

Owner's Name.	Name of Colliery.	Deaths.											
		1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876	1877.	1878.	Total.
Bedford and Co.	Dean Hall	—	—	—	—	1	—	1	—	1	—	—	3
Micklefield Coal Co.	Micklefield	—	—	—	—	1	—	—	—	—	1	1	3
Swan Bank Coal Co.	Swan Bank	—	—	—	—	1	—	—	—	—	—	—	1
E. J. W. Waterhouse	Chevet	—	—	—	—	1	—	—	1	—	—	—	2
Messrs. Harrison	Birkhill	—	—	—	—	1	—	—	—	—	—	—	1
Stanley Coal Co.	Liversedge	—	—	—	—	1	1	—	—	—	—	—	2
Ellison and Broadbent	Whitwell Main	—	—	—	—	1	—	—	—	—	—	—	1
Wilks and Co.	Glass Houghton	—	—	—	—	1	—	—	2	—	—	1	4
J. Denton and Co.	Grimesthorpe	—	—	—	—	1	—	—	—	—	—	—	1
Grosvenor and Son	New Hall	—	—	—	—	1	—	—	—	—	—	1	2
Waterloo and Woodlesford Co.	Woodlesford	—	—	—	—	—	1	—	—	—	1	2	4
J. H. Garbutt	Newton Main	—	—	—	—	—	2	—	—	1	—	—	3
T. H. Robinson	Leeds	—	—	—	—	—	1	—	—	—	—	—	1
Darley Main Co.	Pindar Oaks	—	—	—	—	—	1	—	—	—	2	—	3
J. Helliwell	Deepcar	—	—	—	—	—	1	—	—	—	—	—	1
Newhill Coal Co.	Newhill	—	—	—	—	—	1	—	—	—	—	—	1
W. Parkin and Sons	Robertown	—	—	—	—	—	1	—	—	—	—	—	1
W. Bracewell	Ingleton	—	—	—	—	—	1	1	—	—	—	1	3
Silkstone and Dodworth Coal and Iron Co.	Dodworth	—	—	—	—	—	3	—	—	1	—	2	6
B. Lockwood	Shuttle Eye	—	—	—	—	—	1	—	—	—	—	—	1
W. Lambert	Threshfield	—	—	—	—	—	2	—	—	—	—	—	2
J. Critchley	Batley	—	—	—	—	—	1	—	—	—	—	—	1
W. H. Stone	Aston Main	—	—	—	—	—	1	—	—	—	1	—	2
Fryston Coal Co.	Fryston	—	—	—	—	—	—	1	1	—	—	—	2
John Tordoff	Wibsey Bank Foot	—	—	—	—	—	—	1	—	—	—	1	2
Bastow and Crossley	White Lee	—	—	—	—	—	—	1	—	—	—	—	1
W. Parkin and Sons	Fall Lane	—	—	—	—	—	—	1	—	—	—	—	1
Rhodes, Wright, and Wroe	Park Farm	—	—	—	—	—	—	1	—	—	1	—	2
C. Marsden and Sons	Smithies	—	—	—	—	—	—	1	—	—	—	1	2
Wharncliffe Woodmoor Coal Co.	Wharncliffe Woodmoor	—	—	—	—	—	—	1	—	—	—	—	1
John Crowley and Co.	Wincobank	—	—	—	—	—	—	2	—	—	—	1	3
E. Lockwood	Woodwell	—	—	—	—	—	—	1	—	—	—	—	1
Airedale Brick and Tube Co.	Shipley	—	—	—	—	—	—	1	—	—	—	—	1
E. Brooke & Sons	Stile Common	—	—	—	—	—	—	—	1	—	—	—	1
Grayson, Lowood, & Co.	Lowood's Wharncliffe	—	—	—	—	—	—	—	1	—	—	—	1
T. C. Taylor & Co.	Gomersal Main	—	—	—	—	—	—	—	1	—	—	—	1
J. Haigh & Sons	Snowgate Head	—	—	—	—	—	—	—	1	—	—	—	1
J. & W. Woodhead	Manor	—	—	—	—	—	—	—	2	—	—	—	2
Crossland Coal Co.	Scholes	—	—	—	—	—	—	—	1	—	—	1	2
Wheatley, Nevin, & Barrowclough	Mirfield	—	—	—	—	—	—	—	4	—	—	1	5
Industrial Coal & Iron Co.	Woodhouse Junction	—	—	—	—	—	—	—	2	1	—	—	3
Leathly, Bailey, and Dixon	Andrew Hill	—	—	—	—	—	—	—	1	—	—	—	1
Doles and Lumb Wood Co.	Doleswood	—	—	—	—	—	—	—	1	—	—	—	1
Senior Brothers	Oakwell	—	—	—	—	—	—	—	—	1	—	—	1
Leeds and Yorks. Co-operative Coal Co.	Lofthouse Station	—	—	—	—	—	—	—	—	2	3	—	5
Mid-Lincoln Iron Co.	Monks Abbey	—	—	—	—	—	—	—	—	1	—	—	1
Corton Wood Coal Co.	Corton Wood	—	—	—	—	—	—	—	—	1	3	—	4
D. Micklethwaite and Co.	Wrenthorpe	—	—	—	—	—	—	—	—	1	—	—	1
Monckton Main Coal Co.	Monckton Main	—	—	—	—	—	—	—	—	2	2	—	4
P. Diggett and Co.	Grange Lane	—	—	—	—	—	—	—	—	1	—	—	1
Squire Broadbent	Newmarket	—	—	—	—	—	—	—	—	1	—	—	1
Bell Armitage	Dodworth Road	—	—	—	—	—	—	—	—	—	1	—	1
Jos. Blakeley	Soothill Wood	—	—	—	—	—	—	—	—	—	1	—	1
Yorks. and Derbyshire Coal and Iron Co.	Carlton Main	—	—	—	—	—	—	—	—	—	1	—	1
Jas. Kellett	Joan Royd	—	—	—	—	—	—	—	—	—	1	—	1
Messrs. Jaggar	Emley Moor	—	—	—	—	—	—	—	—	—	1	—	1
C. and H. Tinker	Wood	—	—	—	—	—	—	—	—	—	1	—	1
Walker and Reddick	Sykes	—	—	—	—	—	—	—	—	—	1	—	1
Terry, Greaves, and Co.	Roundwood	—	—	—	—	—	—	—	—	—	1	—	1
Dymond and Co.	Liversedge	—	—	—	—	—	—	—	—	—	1	—	1
South Kirkby Coal Co.	South Kirkby	—	—	—	—	—	—	—	—	—	4	—	4
R. Holliday and Sons	East Ardsley	—	—	—	—	—	—	—	—	—	1	—	1
Quarry House	Holmes and Stocks	—	—	—	—	—	—	—	—	—	—	1	1
Dungworth	Ibbotson and Haigh	—	—	—	—	—	—	—	—	—	—	1	1
Haigh	G. Fountain and Son	—	—	—	—	—	—	—	—	—	—	1	1
Fitzwilliam Hemsworth	R. Fosdick	—	—	—	—	—	—	—	—	—	—	1	1

List of Collieries where Fatal Accidents have taken place—*continued.*

Owner's Name.	Name of Colliery.	Deaths.										
		1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877	1878.	Total.
Bullhouse	J. Hinchcliffe	—	—	—	—	—	—	—	—	—	—	1	1
Denby Grange	Miss E. L. Kaye	—	—	—	—	—	—	—	—	—	—	1	1
Ryhill Main	H. Lodge	—	—	—	—	—	—	—	—	—	—	1	1
Rock	Wilcock and Co.	—	—	—	—	—	—	—	—	—	—	1	1
Newmarket	Newmarket Coal Co.	—	—	—	—	—	—	—	—	—	—	1	1
Flockton	S. Brown	—	—	—	—	—	—	—	—	—	—	3	3
Holroyd	Hodroyd Coal Co.	—	—	—	—	—	—	—	—	—	—	1	1
Beckitt Street	Holdsworth and Wilkinson	—	—	—	—	—	—	—	—	—	—	1	1
	Total	80	69	90	84	133	115	112	267	71	107	81	1,209

With regard to the working of the Acts, and the duties of inspection, I beg to lay before you generally the way in which they have been carried out during the year. It is very desirable that there should be no misapprehension on the part of any person as to the amount of work performed by an inspector in the course of the year. It is, therefore, with no intention or desire to place this matter in a prominent light in any self-laudatory spirit, but for the reason that hitherto the facts have not been realized by the public, who ought to know the various and onerous duties to be carried out by an Inspector of Mines, the discharge of which has rendered the operation of the Mines Regulation Act so effective.

This otherwise seeming parade of my work is made likewise in obedience to your wishes.

The instructions and regulations issued by you have been most thoroughly and completely attended to, and I have to report the result as extremely satisfactory. At the same time I may observe it has been my custom to follow the same line of conduct ever since my appointment so far as the main and leading features of these instructions are concerned; and, therefore, to a great extent they merely confirmed the mode of fulfilling my duties which I had exercised, believing it to be the one best calculated to promote the proper observance of the Act.

Similar work to that chronicled in this Report has been performed by me every year, the difference only being that each year, as the district has expanded, and the output and number of mines increased, and further the metalliferous mines added, that work has become proportionately increased. That no detailed account of this has been presented to you before (save that given in last year's Report) is simply because it would have seemed to be bringing into ostentatious prominence the fact that an inspector having certain duties to perform does perform them.

I have during the year visited 73 collieries for the purpose of inquiring into accidents, attended 33 inquests, and investigated 16 complaints which have been made to me. Besides this, I have made 158 casual or promiscuous visits of inspection to collieries. I have, in addition, attended at the meetings of the board of examination for candidates for certificates of competency, and at the hearing of the cases of prosecution which were instituted by me in the course of the year. I was engaged also in acting as assessor to the commission who inquired into the competency of a manager in Derbyshire.

In the execution of my duties I have again this year travelled rather over 16,000 miles, and the correspondence (which I explained in my last Report was enormous) has continued to increase. The whole of this correspondence passes through my hand, my assistant rendering what help he can; and as the number of mines in my district, including those under the Metalliferous Act, is more than 600, it will be at once apparent that the labours of writing in connection with them take up no inconsiderable portion of my time. The total number of accidents reported to me during last year was 489, or six less than the year before.

I once more willingly express my appreciation of the way in which my assistant, Mr. Gerrard, has discharged his duties. He has aided me in enforcing the provisions of the Act, and has carried out my instructions satisfactorily. He has attended at 14 inquests in the course of the year, and inquired into 58 complaints. He has, besides, visited 265 collieries; at 140 of which he made underground inspections, and in 87 cases investigated fatal and non-fatal accidents. The whole distance which he travelled in the year was 10,177 miles.

There is abundant proof of a steady increase in the beneficial results of inspection, which is corroborated by actual statistics and facts. The number of lives lost in this district in 1878 was in the proportion of five deaths for every million tons of mineral raised; whereas in the year after the commencement of the first Inspection Act, the proportion was 8·6 deaths for every million tons produced. The work of inspection when visiting collieries, more especially when it extends to the workings underground, is of very varied description. An

underground examination of a mine must not be taken to mean that every hole and corner in that mine has been visited. In casual visits the parts inspected must, of necessity, be those which strike an inspector, from observation of the plan or from various other causes, as more particularly calling for inspection.

People seem to be too apt to fall into the way of imagining that because an inspector has been in a mine the day before, or week before, or month before, his visit is a sort of guarantee of its safety. Although it might appear to him at the moment, so far as he could judge, safe, something might be even then occurring in another part of it which would at once bring about an element of danger; and though the part visited might at the time be in good and safe condition, some disturbance might arise, from one cause or another, immediately afterwards, to alter the whole character of the mine. All this clearly indicates that an inspector cannot and is not expected to manage the mines in his district, but is to see that the Act of Parliament is observed by all concerned, and to aid with his advice whenever it is required, or when he thinks it desirable. The actual management must be undertaken by the properly qualified staff of officials at the mine itself—from the certificated manager who directs and controls the whole, downwards through the grades of competent underviewers and deputies. All of these being, in their respective positions, as it were continuously on the spot itself, are alone able to maintain the necessary precautions for safety, and in their hands all responsibility is and ought to be vested.

I regard the 30th general rule, where it is acted up to and carried out, as a very valuable assistance in ascertaining where defects exist in a mine, and thus affording the opportunity of remedying them. This rule gives a permissive power to the workmen to make periodical examinations of the mine. If evils exist, which this examination brings to light, it is to the satisfaction of their employers, their fellow-workmen, and themselves, that record should be made of the same, and steps taken to remove any danger. If, on the other hand, such examination results in a record of all being well, this is still satisfactory to all. I much wish this rule were carried out at every colliery, but, I regret to say, the workmen avail themselves of it at comparatively few. Where this periodical examination is made, I have received assurance from both employers and employed that the effect is highly satisfactory. It has been stated, I believe, by some, as a reason why this rule is not more generally enforced, that the men who make the examination, supposing they found anything wroug, would be unwilling to record the same in the book for fear of ulterior consequences injurious to themselves. I am, however, slow to believe that this has any foundation in fact. I do not myself know any colliery where the owners would not be glad to have the examination made, and the true report thereof recorded; and I think the men on their side would be careful to choose those of their number to conduct snch inspection who would do so honestly and fairly, and upon whose judgment and report they could depend.

Besides the prosecutions I have mentioned in other parts of this Report, I also took proceedings, under your approval, against the manager of East Gawber Collieries, Mr. Side-bottom, for a breach of the first general rule, and likewise against one of his deputies for a further breach of rule. They were brought before the magistrates at Barnsley, and in both cases a penalty was inflicted.

I took occasion in my last Report to refer to the inauguration of a class for practical mining education at the Yorkshire College in Leeds, effected through the liberality of the Worshipful the Drapers' Company, of the City of London. I am glad to say the lecturer reports good progress, and speaks very hopefully of the ultimate successful working of the scheme;—which, indeed, in the centre of such a mining community, ought to receive every encouragement, and no doubt, will be the means of inculcating good sound practical mining knowledge amongst those who will eventually become managers and agents in the district.

The first fatal result of explosion of gas in the year occurred at North Gawber Colliery, near Barnsley, where a man named Andrew Elliott was injured, on the 15th March, and died on the 10th April following. This is No. 16 in the list of accidents.

The colliery belongs to the "Thorp's Gawber Hall Company, Limited," and the accident happened under the following circumstances:—G. Allatt, a collier, had prepared a shot-hole in a "slit," which was to connect two endings, and placed therein a cartridge containing about $\frac{3}{4}$ lb. of powder. Elliot, who was the fire-trier and shot-lighter for the district, then examined the place, and, according to his statement and that of the collier, found it free from gas, and, in his opinion, in a proper condition for the shot to be fired. This was accordingly done by means of a piece of wire heated by inserting it through the gauze of a Davy lamp, the two men retiring some 20 or 30 yards. When the shot ignited, some small quantity of gas exploded, and both men were slightly burnt,—the collier, who very soon recovered, apparently more severely than his companion; indeed the latter continued at his work for five hours afterwards. However, being an old man, over 70 years of age, he succumbed to his injuries, probably from the shock to his system. The mode of using the powder (apart

from the question of the propriety of its use at all), as to the position of the hole, for example, was not, in my opinion, the most judicious, and the shot was a very fast one, leaving a deep "socket." There was quite sufficient evidence to show that a certain amount of gas exploded, and that gunpowder alone was not the cause of burning. The brattice was blown down, and afterdamp was perceived in the place afterwards.

The night deputy had, it appeared, observed a small quantity of gas here upon his examination of the workings, and had placed a danger signal, and personally warned the man Allatt; but if any of this gas remained at the time of Elliott's examination, he must have either disregarded it, or only made a partial inspection, and not observed it.

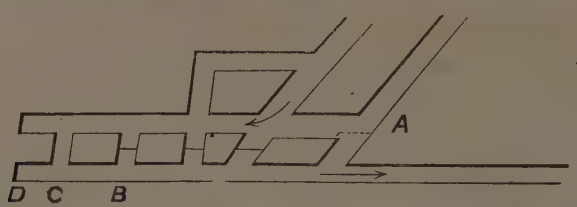
I considered that the deputy who discovered gas before Allatt went to work ought to have taken stronger measures for the prevention of such an explosion as actually did happen, and I also disapproved of a responsible and onerous position being held by a man of the age of Elliott, and I communicated thereon with the manager. The deputy was discharged from his employment; and, as regards Elliott, the reason assigned to me for entrusting him with such duties was, that although really an old man, his faculties were good, and his judgment and experience were considered such as to warrant his being selected for the position.

The next death from explosion last year is No. 47 in the list. This accident occurred at the Stanley Ferry Colliery, near Wakefield, the property of Messrs. R. Hudson and Company, on the 24th August, the injuries then received terminating fatally in about a fortnight.

A man named Joseph MacIntyre was at work driving a "slit" close to a "fault." This "slit" was driven a distance of about 16 yards, and was reported to be free from gas by the deputy, who examined it on the morning in question. As no one else worked in this portion of the mine the account of the explosion is confined to the explanation of MacIntyre himself, and of course therefore cannot be corroborated. He was working with a safety lamp, and had, soon after commencing, fired a shot in the top portion of the coal. Afterwards he prepared a shot in the bottom coals; and having charged it, he tried the place, to see if there were any gas. Having found a little in the top co ner he "wafted" it out with a piece of brattice, and then lighted a small piece of fuze wherewith to ignite the fuze in the shot hole. Whilst standing thus for a moment an explosion occurred, and he was severely burnt. There was no other way in which to account for the explosion. The place was properly "bratticed," and MacIntyre had been authorised to fire his own shots and also the shots of other men in that part of the pit. There appeared to be a good ventilation passing through the mine.

An accident, the third in the year, from explosion of gas, and numbered 56 in the list, occurred on 18th October, at the Smithies Colliery near Barnsley, belonging to Messrs. C. Marsden and Son, resulting in the death four days afterwards of the man who was burnt.

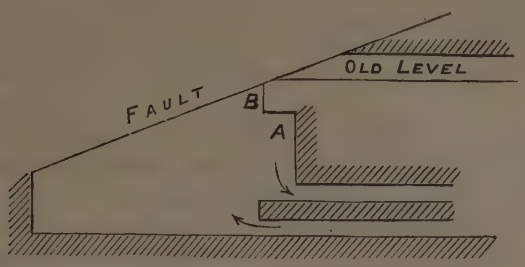
Although the evidence given at the inquest was conflicting, from it, and from examination, it seems that the deceased man, Jos. Hunt, was with his hurrier, Allcock, working in the south level in the "Winter" seam, on the above-mentioned day. The deputy directed them to take safety lamps on that morning; candles had hitherto been used. Hunt had some candles in the place, and he lighted one by means of a match, and put it up, opposite the "slit," about 16 yards from the face at C on the sketch, telling his hurrier not to bring the candle nearer than that point. About noon he moved the light to within four or five yards of the face. Some 40 or 50 yards from here a man was cutting a place through, which "holed"



exactly opposite to a sheet which was hung at A on the sketch, to direct the air to Hunt's working place. This sheet the man knocked down, and allowed to remain so. The result of this was that the air was cut off from Hunt at D, and gas accumulated which ultimately fired at the hurrier's light at B, burning him, but not severely, and so injuring Hunt as to cause his death. It appeared to me that rules had been disregarded, both by the deceased man himself, the deputy, and the man who interfered with the sheet. The deputy was discharged from his situation, and proceedings were instituted against the other man.

The fourth and last fatal explosion of gas in this district during the year (No 75 in the list) occurred at Quarry House Colliery, near Halifax, on the 20th December. This colliery is the property of Messrs. Holmes and Stocks. John Bastow, a collier, was at work in the "hard bed," driving a "benk" 3 yards in width, and his son was hurrying for him. They worked with candles.

Shortly before he intended to finish his work he went from "A," where he was engaged, along the side of the coal, up to the fault at "B," in order to see, as he said, how far he had



to go. When at this point some gas exploded at his naked light, and burnt him. His injuries were very slight, but it seems he suffered from heart disease, and the shock was sufficient to cause his death a few days afterwards. The deputy who examined the workings in the morning did not find any gas, or at any rate, if he did, none was reported. There appeared to me to be a considerable amount of laxity in the discipline at this mine, and I did not think the 1st general rule had been carried out. With your approval, therefore, I have instituted proceedings against the manager, and the hearing of the case is just about to take place.

A man named Wilkinson was killed in the Lundhill Colliery, near Barnsley, on the 26th January by a fall of roof. This is No. 6 on the list. The deceased and a deputy named Fletcher were engaged in setting a prop to support the roof, when suddenly a large fall took place, partially burying both men. They were so fastened by the debris that they could not extricate themselves. Two bye-workmen who were at work near the place, raised an alarm, and were joined by three other men, but, according to the account given by Fletcher, they were all so overcome by fear as to be unable to render assistance. At this time poor Wilkinson was still alive, and, had he been then extricated, might have recovered. Fletcher was held fast by the foot. He got hold of a lever, and endeavoured to liberate himself, but to no purpose. At the end of half an hour a second fall took place, this time completely covering Wilkinson, and probably at once killing him. The other man had his head still uncovered. Had it not been for the arrival of a man named Miller, who succeeded in liberating him, two men might have been killed instead of one. Fletcher was under the fall about an hour and a quarter, and it is easy to imagine what that length of time would seem to him, expecting death every moment. The conduct of some of these men was utterly at variance with the usual heroism and disregard of danger displayed by miners under similar circumstances, and affords a marked contrast to the qualities which as a rule charactize them.

No. 34 accident.—This occurred from a fall of roof under somewhat curious circumstances. A collier named Worrill with his fitter were engaged getting coal in the Nunnery Colliery, near Sheffield, on the 21st June. An empty corve was standing near them, and, for some reason Worrill went to look into it, leaning his neck over the edge. At that moment a small piece of roof fell, and striking him on the head, almost severed it from his body. The piece of stone which fell was very thin, and it only fell about two feet, so that such a result seems somewhat remarkable. The roof had appeared good and sound, and there seemed to be no reason why this piece of stone should have broken off. It did not appear that blame could be attached to any person for this melancholy occurrence.

No. 48 accident.—On the 27th August a boy was killed in the Snydale Colliery, near Pontefract, by a fall of roof. A collier and his son were at work removing and packing up a fall of roof which had taken place in a main "bord." A piece of stone was overhanging in a dangerous manner, and on the day previous the deputy had directed it to be taken down. The men then engaged did not succeed in effecting this, and on the day in question Marsh, the collier above-mentioned, continued the work. He tried for some time to remove the stone with a bar and pick, but, not succeeding, he began to fill up the fallen débris. Whilst so engaged, the boy Wilcox came to him, and asked if the shot lighter were there. Marsh replied "No;" and his account of what then took place was that Wilcox ran past him, and that just as he was underneath the stone, it fell upon him. This seemed rather curious, for the boy was not sitting or remaining under the part which fell, and Marsh had himself been passing and repassing and working beneath it all the morning. The Coroner at the inquest censured Marsh for not having persevered with his endeavours till he had removed the stone.

No. 76 in the list.—On the 21st December an accident occurred at Thrybergh Hall Colliery, near Rotherham, the property of Messrs. J. and J. Charlesworth. This was caused by a fall of coal, and is the only accident of the kind during the year which resulted in the death of more than one person. In this case two colliers lost their lives. It does not, however, appear to me that there were any extraordinary circumstances in connection therewith to note for consideration. The spraggs were duly set according to rule, the men were experienced

miners, and the place was to all appearance safe. It was the old cause of so many kindred accidents,—a "slip" which was unperceived, and which suddenly liberated the coal, killing the two poor fellows underneath.

Under the next heading in the list, that of "Deaths in shafts," the first fatality in the year occurred on the 29th July (No. 39), at Pildacre Colliery, near Wakefield, belonging to Messrs. Naylor and Company.

When at work on this day, the hanger-on observed that the cage did not descend as it ought, and, thinking there must be some obstruction, he informed a deputy of the matter. A man named Dewse, an assistant hanger-on, was sent to examine and find out what was wrong. Having got into the cage he was raised about five yards, at about which point it was imagined the obstruction existed. Nothing was however found to be wrong, and Dewse told the hanger-on to signal for him to be lowered. Apparently, the engineman did not respond to the signal, which was repeated again and again. All this time, however, the rope had been actually lowering, though the cage remained fast, and on Dewse moving in the cage from one side to the other, it suddenly fell to the bottom with such violence as to break his leg. The reason why the cage had stuck, appeared to be that a nut had come off one of the bolts securing to the cage a bar which is attached to the "shoe" working on the "guides." The bolt thus liberated caused the bar to drop a little, and thus the "shoe" would nip the wooden guides, and fasten the cage. This nipping would be increased by the weight of Dewse, who stood on that side of the cage, but so soon as he moved it would be liberated, and, there being then an amount of slack rope, the cage fell to the bottom. The man did not die till the 15th August, and the doctor's certificate stated his death to be the result of disease of the lungs; but it would seem that the primary cause was the above accident.

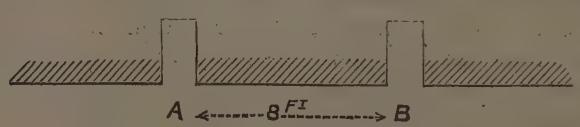
On the 8th November a terrible accident occurred at the Waterloo and Woodlesford Co.'s Colliery, at Woodlesford, near Leeds, (No. 60), by which two lives were lost. This arose from a case of overwinding; and what makes the disaster remarkable is the fact that a safety or disengaging hook was in operation at this pit at the time. The men were raised into the head gear; the hook disengaged the rope, but failed to hold the cage, which, with the two men in it, fell to the bottom of the shaft.

The engineman's version of the matter was that he wound up the men all right to the point where he usually reversed his engine. On doing this he found that one of the valves stuck, so that the steam passed direct into the exhaust, and that although he applied his break he could not stop the engine. There did not seem to be any evidence to corroborate the engineman's statement, and afterwards, when examined, the valve appeared to work properly.

The banksman was not close to the pit mouth at the time of the accident, as he ought to have been, and did not therefore put the rests across so soon as the cage passed him. Had he done this, it is just possible that, as the headgear is very low, and the cage had therefore a very short distance to fall, the rests might have supported the cage, and prevented it from falling down the shaft.

The signalling apparatus did not seem to be in good order, but yet the signals were given, and it did not appear that they had not been heard and attended to by the engineman. The cage was not ascending at great speed when it passed the shaft top; so the banksman deposed; and this was confirmed by the fact that the rope, when disengaged, rested on the headgear, and was not drawn into the engine-house. The safety hooks have been in use at this colliery for some time, had been frequently tested, and up to this time had answered perfectly. Part of the apparatus consists of an iron ring or eye, through which the hook passes, and from this ring two pieces seemed to have been broken, presumably by the hook striking it when ascending. The result of this breakage was, that instead of the ring holding the cage when the rope became disconnected, it allowed the hook to pass through; hence the accident. This ring was made of cast iron; but it seems to me most desirable that it should be made of steel, or wrought or malleable iron instead. The jury, at the inquest, expressed the same opinion, and I laid the recommendation before the manager. Proceedings were taken against the banksman for not being at his post at the shaft top.

Under the column of "Deaths from miscellaneous causes underground," accident No. 36 in the list records the death of George Sadler from explosion of gunpowder. He was a shot-lighter, and was employed at the Rockley Colliery, near Barnsley. On the 13th July he



visited a working place where the men had prepared two shots, each having about 3 oz. of powder in, for the purpose of firing them. By means of a wire and his Davy lamp, he lighted

the fuze of the shot at A, and then went to that at B, only some eight feet distant. He would seem to have found some difficulty in getting the fuze to ignite here, for while he was so engaged the shot at A exploded, and he was thrown violently against the pack wall behind him. His spine was injured, and he died about a week afterwards. I have at various times pointed out the great danger which exists, in my opinion, in lighting the fuze of two or more shots in the same place at the same time. One shot should always be allowed to explode before another is lighted. The practice, as adopted by Sadler, is a most dangerous one; and I pointed out my objections to the manager, who promised to take steps to put a stop to it.

No. 19 accident in the list.—This occurred on the 24th March, and involved the greatest loss of life in this district during the year. The colliery is called Flockton, is situate near Barnsley, and is the property of Mr. S. Brown. It is only of very limited extent, and the number of persons employed is few; but of these, I regret to say, three were killed on the above-named day from suffocation by carbonic acid gas. The accident happened on a Sunday. The pit had not been at work on the previous day, and on that evening it was decided that the deputy and two bye-workmen should go down next morning to do some necessary work in the roadways, in order to improve the ventilation. They accordingly went down about 6 a.m., and nothing having been heard of them at 12 o'clock, the owner, Mr. Brown, went down to see what they were doing. He took a collier with him, and when they arrived at the bottom of what is known as the "slant bord," the three men were found lying upon their faces, dead. There had been "damp" in the pit frequently, the men having on some occasions to abstain from work by reason of it. Higgins, the deputy, was in charge of the pit, and those with him would, no doubt, act under his directions. It seemed that this colliery depended, to some extent, for its ventilation upon an adjoining pit, and a short time before this accident, owing to the building of stoppings in the air-courses of the neighbouring mine, the air in the Flockton mine was sensibly diminished. It was for the purpose of remedying this that the owner was doing such work as was being pushed forward on the 24th March. Still it seemed to me that the arrangements altogether were most deficient, and that the 1st general rule was very imperfectly attended to. The furnace was not properly kept up, and I have little doubt but on the morning when these poor men lost their lives it had been allowed to get down, thereby causing the ventilation to be almost at a standstill. With your sanction, therefore, I instituted proceedings against Mr. Brown, the owner; and the Bench at Barnsley, having strongly animadverted on the case, fined him 15*l.* and costs.

Half the penalty I handed over, with your permission, to the widows of the deceased men.

Accident No. 31 in the list.—This, like the last, was occasioned by black damp, and caused the death of a man named John Hodgson in a pit situate at Ingleton, the property of Mr. Bracewell.

On the morning of the 7th June Hodgson and another man were at work in the Lady Pit of this colliery, under the direction of Metcalfe, the overman. They began work at 6 a.m., and were getting coal, using naked lights. During the morning the ventilation, which was good when they began, seemed to get more and more feeble, and about 9 o'clock they left the "face," and, by Metcalfe's orders, commenced to renew some timber on the main road. No other persons were at work in the pit on that day. All went well until 2 o'clock, when Hodgson determined to go back to the "face" to get some candles which he had left there. His companion endeavoured to dissuade him, but in vain, so followed at a short interval. Presently, Hodgson's candle was observed to go out, and he stumbled and fell. Upon being called he made no reply, and the other man went forward, got hold of him, and dragged him for two or three yards back, until, feeling himself being gradually overpowered by the gas, he was obliged to desist, and run away. Hodgson's body was recovered later in the afternoon, life being quite extinct. The pit is only a shallow one, and it appears that the direction of the atmosphere on the surface affects to a considerable extent the ventilation below. On the morning in question the wind changed about 7 o'clock, and the air below gradually became worse. Natural ventilation, however, was not solely depended on, for there was a small fan worked by the same engine which wound the coals and men. When the fan only is required to work, the drum is thrown out of gear. When this is done the fan runs at double the speed, and this of course materially affects the ventilation. During the morning water was being drawn up the shaft at intervals, and at the rate of about 12 tubs per hour. At these times the fan would be standing, the drum not being thrown out of gear, and the fan only working in connection with the winding apparatus. I think the arrangements for ventilation were capable of very considerable improvement, and advised the manager that the fan should be altered so as to work independently of the winding engine, and be kept constantly in operation. I have little doubt that, owing to the drawing of water, and from other causes of stoppage during the night and early morning, the fan was really of very little practical use.

Under the head of "Inclined planes," an accident (No. 8) occurred on the 29th January, which disclosed a reprehensible and dangerous practice. On that day a boy, named Geo. Blankley, a driver, was killed in the Simon Wood Pit, belonging to Earl Fitzwilliam, under the following circumstances:—The boy's duty was to draw tubs, with a horse, from the bottom of a short incline along a level. Owing to the empty tubs leaving the rails about half way up this incline, there was a stoppage, and the boy in charge of the wheel at the top went down to put them on the road. He then, with another boy, endeavoured to start the tubs again, but there being a "fault" just at that point, the road was there nearly level, and they were unable of themselves to do so. The occurrence, however, it seems, was no uncommon one; and, under similar circumstances, it was the habit of Blankley to take his horse up and attach it to the full train of tubs in order to start them. Having done this, he was in the act of detaching his horse when he slipped and fell, the tubs passing over him. I certainly am of opinion that such a custom ought not to have been allowed, and I pointed out to the manager that by a very trifling alteration—the raising of the flat a few inches—any excuse for so doing would be removed.

Accident No. 28 in the list.—This occurred at Dark Lane Colliery, near Mirfield, belonging to the Mirfield Coal Co., on the 16th May.

A collier and his hurrier, S. Whitehead, were working in the Blocking seam, driving a heading near a small pumping engine which had just been erected, and in fact had been only that day tried for the first time. About 8 p.m. the collier was endeavouring to stop this engine, and finding some difficulty in doing so called to his hurrier to assist him. Whitehead, in coming to him, passed over some loose boards which covered the hot well into which the engine exhausted its steam. These boards had been temporarily laid down, and were not permanently fastened. The boy slipped between them into the hot water, and was scalded so severely that he died next day.

As instances of how very simply sometimes accidents are caused, I will just mention two:—the first on the 13th December (No. 72 in the list), which arose from the kick of a horse. A boy was employed as a driver underground at East Gawber Colliery, near Barnsley, and whilst engaged at his work received a kick from his horse. The animal, it was ascertained, had not been teased, and there did not appear to be any reason why it should have struck the boy; but the result of the kick unfortunately produced the lad's death a day or two afterwards. The second accident occurred at Dodworth Colliery, near Barnsley, on the 8th March, (No. 14 in the list,) to S. Wilkinson, who was employed as a carter on the surface. When dirt comes out of the pit it is tipped into what is called a "dobby" waggon, which holds about two tons. Wilkinson was standing by the side of this when the banksman tipped a corve of dirt into it. One small piece fell on the floor, and the carter picked it up, and put it into the waggon, and in so doing trapped his thumb. Nothing was thought of the injury, which appeared to be slight, but about a fortnight afterwards lock-jaw supervened, and the man died on the 25th of the same month. In neither of these cases could I see that blame was attributable to any person.

Of the remaining accidents which occurred on the surface by means of waggons either running over or crushing persons, only one or two appear to me to call forth any special observations. They were of the usual, and, I regret to say, not uncommon character. On the 13th April an accident occurred at the Holmes Colliery, near Rotherham, (No. 22 in the list,) which resulted in the death of Thos. Hinds, a shunter employed in attendance on a locomotive. This locomotive had to pass through a tunnel connecting the branches with the Midland Railway, and at the time of the accident had traversed about three quarters of the length of the tunnel, or about 25 yards, when, leaving the rails, it crushed Hinds against the wall side. He was riding on the step of the engine, although he had been repeatedly warned not to do so. The tunnel in its narrowest part is 9 ft. 7 in. wide, leaving 2 feet on one side from the rail to the wall, and 2 ft. 6 in. on the other. It had been in use for more than 13 years, and no accident had happened in it before. I think the size of the buffers of the waggons was small; and this may have caused them, in rounding a turn in the tunnel, to become locked, and so throw the engine off the rails. I pointed this out to the manager, who at once took steps to enlarge the size of the buffers, as well as to issue strict injunctions, and post printed notices prohibiting any person riding on the locomotive step.

A man was killed at Messrs. Pope and Pearson's Collieries, near Normanton, on the 10th May, (No. 26 in the list,) under the following circumstances:—He was employed as a labourer on the surface, and was engaged in removing part of the pit heap, and an old wall in connection with the erection of a slack hoist, when a portion of the walling, about 3 feet square, gave way suddenly, and struck him on the head, killing him instantaneously. The man was over 50 years of age, and experienced in the work on which he was engaged; neither did it appear that there were any indications beforehand that the wall was likely to give way.

During the year three fatal accidents occurred which do not come within the provisions of the Act, and are not classed in the accompanying list, but yet which were to some extent connected with collieries. One of these was on a railway communicating with the Thornhill Collieries near Dewsbury, owing to a locomotive falling down an embankment. Two men who were riding on it were killed. The next was on the railway communicating with the Hoyland Silkstone Collieries; and here again two persons were killed who were on some waggons which a locomotive was taking down an incline, and became overpowered in so doing. The third accident occurred in a tunnel at Sheffield in connection with the Nunnery Collieries, when, owing to a collision therein, two men on the locomotive were killed.

I do not know that I can add anything to what I have said in former Reports on the subject of explosions of gas. They seem to recur in spite of all efforts to prevent them. All known means to put an end to, or at any rate reduce, these calamities, should be practised to their fullest extent. It is not sufficient to devise means and frame rules, unless these means are utilised, and the rules carried out. And, as the most important fact to be borne in mind, I again impress upon those in whose care mines are placed, that a thorough, complete, and adequate ventilation is absolutely necessary; and this ventilation, to be adequate, must be so distributed and conducted as to sweep every place in the mine, leaving no holes and corners untouched, but enabling the workpeople in every part to breathe pure and good air. I have said so much on this subject in previous Reports that to dilate further on it appears almost like useless reiteration; yet its vast importance must be my justification for again mentioning it. There is nothing new to bring forward. What I have said before holds good to an equal extent now, and the same measures I advocated a year ago I maintain as earnestly now.

Fan ventilation, in my opinion, supersedes all others when there is any tendency in a mine to give off gas; and the number of fans in operation in the fiery mines in this district is rapidly increasing.

To exclude naked lights and prohibit gunpowder in a mine where, notwithstanding a naked light of enormous dimensions in the shape of a furnace is allowed to remain, even when constructed on the best and safest known principles, is, to my mind, a mistake.

The questions of safety lamps and the use of gunpowder are full of such fearful import in a portion of this district, that I cannot refrain from once more recording my settled conviction thereon. I think that in fiery mines, and indeed all mines known to give off gas, the use of safety lamps and the abolition of gunpowder are absolutely necessary. By this means at any rate one of the causes which has sometimes been instrumental in producing an explosion would be removed.

If the adoption of these means at any mine were to be put in operation at the cost of an adequate ventilation, then surely there would be evident signs of want of competency in the management; but, I take it, no manager so anxious to take measures for the safe working of the mine under his charge as to introduce safety lamps and prohibit blasting, would, at the same time, be likely to neglect the very first principles of safety, such as are contained in ample and adequate ventilation. Where safety lamps are used the strictest care should be taken that their examination before use be as complete and searching as possible. Experiments which have been made in this district during last year have shown that safety lamps, after having been examined and declared ready for use, have yet, on being tested with gas, been found to be defective. This tends to show that some more practical and certain inspection of lamps before being given out for use is very desirable.

Too strict a discipline as regards safety lamps, wherever they are used, cannot possibly be observed; and if the regulations had been less stringent at certain collieries, where from time to time enormous discharges or outbursts of gas have occurred, other explosions would have had to be recorded with probably great loss of life. At Corton Wood and at Mitchell Main collieries there have been such outbursts during the past year. In both cases Stephenson lamps were used, the lights were put out, and the men left the mine in safety. An open light or a defective lamp in either case would have in all probability produced disastrous consequences. It is almost impossible to point to one rule more than another, bearing on this subject, as of greater importance; but I would draw attention to the fact that the examination of the mine made by the deputies before the workmen descend should be very complete, and that until such has been finished no workman should on any account be allowed to enter. I wish also to allude to the care which is necessary to be taken with regard to a proper record being made of these examinations, and an entry made in the books kept for the purpose, with as little delay as possible. Gas, it must be remembered, in whatever quantities it may be found, must be always reported in the books. Deputies are apt, sometimes to think, that the reporting of gas may be left to their own discretion, that is to say, if they only find "a little," they need not report it, especially if they have taken steps to remove it. Those deputies who hold this view should be undeceived. The work-

men, too, can render most valuable assistance in a way which they often neglect, by informing in the proper quarter whenever and so soon as they observe anything to be wrong; for example, the accidental opening of a door, or the disarrangement or disturbance of any sheet, or stopping, or bratticing.

Much has been said about the dust in dry mines being the cause of aggravating an explosion, and without doubt there is very much truth in this. I believe myself that in many cases quite as much mischief (if not more) is produced by the red-hot dust as by the gas itself; and I think it an admirable system, and one to be followed as widely as possible, for the roadways in all mines which are dry and dusty to be periodically watered. If an explosion then occurred I think its intensity would thus be reduced.

Accidents from falls of roof and sides form the bulk of the whole mortality, not only in this district, but throughout the country; 40 out of 81, or about one half, was the proportion during last year in this district, whilst, notwithstanding that two accidents alone in other parts of the country from explosion of firedamp caused 472 deaths, the proportion of those killed from falls was one third of the total number of lives lost in the kingdom.

Men themselves frequently neglect to use the means supplied to them for ensuring their own safety, and prefer to run the risk of injury or death, in the endeavour to save time, to taking steps to make their working places secure.

Falls from slips, and partings, and "pot holes" are fruitful sources of accident, and these it is, in many cases, almost impossible to prevent or foresee. The defective and dangerous state of the roof or coal cannot be detected, and such falls occur, without a moment's warning, in apparently a safe condition of the strata.

Again, deputies are not always careful to see that instructions they may give regarding places which require to be attended to are carried out. If a place, in the opinion of a deputy, be dangerous, the workman should be withdrawn, and steps taken at once to render it secure.

The same regulations as to the examination of working places before they are entered by the men, which apply to the presence of gas, hold good as regards other sources of danger. A place should be examined as much as to the condition of its roof and sides, as to the existence or absence of gas.

It is imperative that an ample supply of whatever timber is required should be kept not only on the premises but at hand for those who require it. And wherever coal is "holed," the necessary number of short props or "sprags" should be set. The pack walls, too should be kept built up to within as close a distance of the "face" as possible.

That only five deaths in shafts should have occurred during the year, when it is considered that about 1,200 pits are at work in this district, and that the 48,000 persons employed underground have daily descended and ascended them, may be regarded as very satisfactory. I took the opportunity last year of advocating the adoption of detaching hooks; and although from the partial failure of one of these this year two persons were killed, I do not see any reason to change my opinion. They are in operation at a large number of collieries in this district, and have been to my knowledge in several instances the means of saving life. Some say, as they do of safety lamps, that, though good in themselves, they are a means of drawing off the attention from other and more valuable necessaries, and so having an undue dependence placed upon them. This I do not agree with, and, as I have said, I regard both the one and the other as auxiliaries, not as substitutes.

Amongst deaths from miscellaneous causes underground, many are still those of boys who, notwithstanding warnings and instructions to the contrary, persist in preceding their tubs when hurrying, and become overpowered, and of others who set rules at defiance by riding on the top of full trains of tubs, and either falling off, or being crushed against the roof.

All should be thoroughly instructed as to their duties, and examples made of those who disobey the rules.

It is of the first importance that the rule which requires refuge or safety holes to be made at regular and fixed intervals, should be strictly carried out. And all such holes should at all times be kept free and clear of rubbish or any materials.

The accidents which have occurred on the surface have been occasioned chiefly by waggons either running over or crushing persons, and I cannot add to the remarks I have made in former Reports on this subject.

The solitary death in the ironstone mines in this district during the year occurred at Osmondthorpe, near Leeds, the property of the Low Moor Iron Company. It was caused by a fall of roof, but there is nothing special in the details which I need here enumerate.

I have nothing of importance to which to call your attention in connection with the observance of the educational requirements of the Act during the year.

As is known to you, a considerable number of mines in this district, working the thin seams in the neighbourhood, more particularly of Leeds, Bradford, and Halifax, are of such

a nature as to compel the employment of boys between 10 and 12 years of age, if they are to be worked at all. At these mines, therefore, advantage has been taken of certain clauses of the Mines Regulation Act, under which the Secretary of State, at his discretion, grants an exemption for the employment of boys of this age. The number of such boys has been gradually diminishing. Whereas in 1873, 837 was employed, in 1874, 615, in 1875, 470, in 1876, 398, in 1877, 374, last year gives us a total under this head of 302, or 72 less than were employed in the previous year, and 535 less than in the year immediately succeeding the passing of the Mines Regulation Act of 1872. I do not anticipate that so long as the mines in question continue to be worked, the present number will be materially reduced; but it will be seen that in the last six years, whilst this diminution has been proceeding, the production of mineral has in nowise been reduced, but considerably increased.

In the past year there there were five females between 10 and 13 employed aboveground in this district, three between 13 and 16, and 11 above 16, or 19 altogether, as compared with a total of 16 in the previous year. The number of persons under the age of 16 employed at the mines of this district aboveground and below in the year 1878 was 7,930, out of a total of 59,951, or more than one seventh; and, referring to the list of deaths, the proportion killed aged 16 and under is 17 out of a total of 81, or about one fifth.

The number of collieries in this district in 1878 is 525, as compared with 543 in 1877, or 18 less.

I have still continued to receive from time to time a large number of complaints, the majority of which, I regret to say, were anonymous communications. However, one and all have been attended to and carefully investigated.

There is nothing in connection with the mines in Lincolnshire to which I need specially draw your attention; and I am happy to add that no fatal accident whatever has occurred there during the year.

I have, &c.,
FRANK N. WARDELL.

The Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State.

LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in MR. WARDELL'S DISTRICT, comprising YORKSHIRE AND LINCOLNSHIRE, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Jan. 3	1	Victoria	Leeds	John Haigh & Sons	S. Crabtree	Driver	13	Crushed by corves	–	–	–	1	–	1
„ 8	2	West Ardsley	Ditto	West Yorkshire Iron and Coal Co.	G. Brassington	Timber borrower.	51	Fall of roof	–	1	–	–	–	1
„ 12	3	Beckett Street	Ditto	Holdsworth & Wilkinson	Geo. Newell	Hurrier	15	Ditto	–	1	–	–	–	1
„ 15	4	Thrybergh Hall	Rotherham	J. and J. Charlesworth	Jno. Oxley	Driver	15	Crushed by corves	–	–	–	1	–	1
„ 24	5	Wibsey Bank Foot.	Bradford	John Tordoff	J. Dickinson	Hurrier	18	Fall of roof	–	1	–	–	–	1
„ 26	6	Lundhill	Barnsley	Lundhill Coal Co.	J. Wilkinson	Collier	25	Ditto	–	1	–	–	–	1
„ 28	7	Park, Liversedge	Dewsbury	Park Coal Co.	E. Ingham	Hurrier	13	Crushed by corves	–	–	–	1	–	1
„ 29	8	Simon Wood	Barnsley	Earl Fitzwilliam	G. Blankley	Driver	14	Run over by corves	–	–	–	1	–	1
„ 31	9	Featherstone Main.	Pontefract	Featherstone Main Coal Co.	E. Walker	Collier	20	Fall of coal	–	1	–	–	–	1
								Total—January	–	5	–	4	–	9
Feb. 1	10	Flockton	Wakefield	Milns, Stansfeld, & Co.	John Pell	Collier	22	Fall of roof	–	1	–	–	–	1
„ 13	11	Monk Bretton	Barnsley	Monk Bretton Coal Co.	Charles Silcock	Filler	28	Fall of coal	–	1	–	–	–	1
„ 22	12	Manvers Main	Ditto	Manvers Main Coal Co.	G. H. Gibson	Driver	17	Fall of roof coal; died 17th April 1878.	–	1	–	–	–	1
„ 28	13	Old Mill	Ditto	Wm. Day	Jas. Waller	Collier	—	Fall of coal	–	1	–	–	–	1
								Total—February	–	4	–	–	–	4
Mar. 8	14	Dodworth	Barnsley	Silkstone and Dodworth Coal Co.	S. Wilkinson	Carter	43	Crushed thumb from piece of shale falling on it; died 25th March.	–	–	–	–	1	1
„ 13	15	Hodroyd	Ditto	Hodroyd Coal Co.	Henry Addy	Collier	44	Fall of roof	–	1	–	–	–	1
„ 15	16	North Gawber	Ditto	Thorp's Gawber Hall Co.	–	Shot-firer	—	Explosion of fire-damp	1	–	–	–	–	1
„ 19	17	Tankersley	Sheffield	Newton, Chambers, & Co.	Peter Renshaw	Collier	46	Fall of roof	–	1	–	–	–	1
„ 21	18	Ravenslodge	Dewsbury	G. & J. Haigh	Jas. Mitchell	Ditto	42	Ditto	–	1	–	–	–	1
„ 24	19	Flockton	Barnsley	Samuel Brown	Arthur Higgins	Deputy	—	Suffocated by carbonic-acid gas	–	–	–	3	–	3
					Thos. Jaggar	Dayman	—							
					I. Burrows	Ditto	—							
								Total—March	1	3	–	3	1	8

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Apr. 6	20	High Moor Lane	Bradford	Low Moor Iron Co.	Edward Dogerty	Hurrier	18	Crushed by corves	–	–	–	1	–	1
„ 6	21	Crosses	Ditto	Bowling Iron Co.	A. Barraclough	Ditto	15	Fall of roof	–	1	–	–	–	1
„ 13	22	Holmes	Rotherham	Rotherham and Masbro' Coal Co.	Thos. Hinds	Shunter	43	Crushed by locomotive; died 4th May.	–	–	–	–	1	1
„ 15	23	Streethouse	Normanton	H. Briggs, Son, & Co.	J. Lumb	Ditto	17	Crushed by waggons; died 4th May	–	–	–	–	1	1
„ 18	24	Newmarket	Leeds	Newmarket Coal Co.	–	–	66	Crushed by waggons	–	–	–	–	1	1
„ 23	25	Low Stubbin	Barnsley	Earl Fitzwilliam	Benj. Carr	Deputy	—	Fall of roof	–	1	–	–	–	1
								Total—April	–	2	–	1	3	6
May 10	26	West Riding	Normanton	Pope, Pearson, & Co.	Jno. Ryan	Labourer	56	Fall of earth on surface	–	–	–	–	1	1
„ 16	27	Rock	Leeds	Wilcock & Co.	Wm. Nicholson	Fire-clay miner.	45	Fall of roof; died 30th July	–	1	–	–	–	1
„ 16	28	Dark Lane	Dewsbury	Mirfield Coal Co.	S. Whitehead	Hurrier	16	Scalded from falling into hot water; died 17th May.	–	–	–	1	–	1
„ 16	29	East Gawber	Barnsley	R. Craik & Co.	A. Gyte	Trapper	12	Crushed by corves; died 13th June	–	–	–	1	–	1
„ 23	30	New Hall	Leeds	Grosvenor & Son	Jas. Paterson	Collier	33	Fall of coal	–	1	–	–	–	1
								Total—May	–	2	–	2	1	5
June 7	31	Ingleton	Ingleton	Wm. Bracewell	Jno. Hodgson	Drifter	33	Suffocated by carbonic-acid gas	–	–	–	1	–	1
„ 19	32	Ryhill Main	Wakefield	Henry Lodge	D. Nilstrip	Hurrier	18	Fall of roof	–	1	–	–	–	1
„ 19	33	Wooley	Barnsley	Wooley Coal Co.	Wm. Smith	Collier	60	Ditto	–	1	–	–	–	1
„ 21	34	Nunnery	Sheffield	Nunnery Coal Co.	John Worrill	Ditto	46	Ditto	–	1	–	–	–	1
								Total—June	–	3	–	1	–	4

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives Lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous underground.	Above Ground.	Total.
1878.														
July 10	35	Wood	Bradford	Bowling Iron Co.	Wm. Wilkinson	Collier	—	Fall of roof	–	1	–	–	–	1
„ 13	36	Rockley	Barnsley	T. Mann & Co.	Geo. Sadler	Shot lighter	35	Explosion of powder; died on 21st July.	–	–	–	1	–	1
„ 27	37	Conyers	Dewsbury	G. & J. Haigh	W. H. Metcalfe	Hurrier	16	Fall of roof; died on 4th August	–	1	–	–	–	1
„ 27	38	Denaby Main	Rotherham	Denaby Main Coal Co.	B. Knowles	Examiner of ropes.	40	Crushed by corves	–	–	–	1	–	1
„ 29	39	Pildacre	Dewsbury	John Naylor and Co.	Henry Dews	Dataller	—	Fell with cage in shaft; died on 15th August.	–	–	1	–	–	1
„ 30	40	Denby Grange	Wakefield	Miss E. L. Kaye	Joseph Taylor	Collier	31	Fall of roof	–	1	–	–	–	1
„ 31	41	Orgreave	Rotherham	Rothervale Coal Co.	F. Fisher	Ditto	23	Fall of coal	–	1	–	–	–	1
								Total—July	–	4	1	2	–	7
Aug. 5	42	Bullhouse	Penistone	J. Hinchcliffe & Co.	Thos. Marshall	Collier	—	Fall of roof	–	1	–	–	–	1
„ 8	43	Wincobank	Sheffield	Jno. Crowley & Sons	John Downs	Ditto	—	Crushed by corves	–	–	–	1	–	1
„ 16	44	Silkstone and Dodworth.	Barnsley	Silkstone & Dodworth Coal Co.	Wm. Jones	Labourer	59	Crushed by waggons	–	–	–	–	1	1
„ 17	45	East Gawber	Ditto	R. Craik & Co.	Wm. Pickles	Driver	13	Crushed by corves	–	–	–	1	–	1
„ 19	46	Silkstone	Wakefield	R. Hudson & Co.	W. H. Broadhead	Ditto	16	Ditto	–	–	–	1	–	1
„ 24	47	Stanley Ferry	Ditto	Ditto	F. McIntyre	Collier	35	Explosion of gas; died 7th Sept.	1	–	–	–	–	1
„ 27	48	Victoria	Pontefract	Rhodes & Dalby	Wm. Wilcox	Driver	16	Fall of roof	–	1	–	–	–	1
„ 28	49	Fitzwilliam Hemsworth.	Ditto	R. Fosdick	Rd. Hancock	Screener	13	Crushed by waggons	–	–	–	–	1	1
								Total—August	1	2	–	3	2	8
Sept. 11	50	Wharncliffe, Carlton.	Barnsley	R. Craik & Co.	Thos. Barker	Collier	30	Fall of roof	–	1	–	–	–	1
„ 16	51	Tinsley	Rotherham	B. Huntsman	Geo. Strutt	Dayman	64	Crushed by corves; died Oct.	–	–	–	1	–	1
								Total—September	–	1	–	1	–	2

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Oct. 1	52	Hoyland Silkstone.	Barnsley	Wells, Birch, Ryde, & Co.	Jas. Kilcullan	- - -	28	Fall of roof	–	1	–	–	–	1
„ 11	53	Car House	Rotherham	John Brown & Co.	Oliver Fowler	Trammer	51	Crushed by corves	–	–	–	1	–	1
„ 14	54	Haigh	Barnsley	Geo. Fountain & Son	Jas. Wakefield	Hurrier	18	Fall of roof	–	1	–	–	–	1
„ 18	55	Park Liversedge	Dewsbury	Park Coal Co.	David Wood	Collier	27	Ditto	–	1	–	–	–	1
„ 18	56	Smithies	Barnsley	C. Marsden & Son	Joseph Hunt	Ditto	23	Explosion of gas; died 22nd Oct.	1	–	–	–	–	1
„ 25	57	Featherstone Main.	Pontefract	Featherstone Main Coal Co.	John Hunter	Driver	14	Run over by corves	–	–	–	1	–	1
„ 29	58	Wheldale	Ditto	Wheldale Coal Co.	Stephen Gover	Collier	18	Fall of coal and roof	–	1	–	–	–	1
								Total—October	1	4	–	2	–	7
Nov. 4	59	Glass Houghton	Pontefract	J. D. Thorp's Exors.	J. Mattison	Driver	63	Crushed by corves	–	–	–	–	1	1
„ 8	60	Waterloo Woodlesford.	Leeds	Waterloo Woodlesford Coal Co.	Solomon Butterworth.	Colliers	33	Fell with cage down shaft after safety hook disengaged.	–	–	2	–	–	2
					Robert Inman		31							
„ 13	61	Rawmarsh	Rotherham	J. & J. Charlesworth	Geo. Shaw	Packer	53	Fall of roof	–	1	–	–	–	1
„ 13	62	Wooley	Barnsley	Wooley Coal Co.	Wm. Staley	Collier	50	Fall of roof; died 14th November	–	1	–	–	–	1
„ 13	63	Dungworth	Sheffield	Ibbotson & Hague	Thos. Hawksworth	Hurrier	14	Fell down shaft	–	–	1	–	–	1
„ 15	64	Edmunds Main	Barnsley	Edmunds and Swaithe Main Co.	Chas. Harper	Screenman	56	Crushed by waggons; died 16th Nov.	–	–	–	–	1	1
„ 18	65	Morley Main	Leeds	W. Ackroyd & Bros.	Thos. Herald	Collier	29	Fall of coal and roof	–	1	–	–	–	1
„ 18	66	Micklefield	Ditto	Cliff & Sons	Jas. Heelegrave	Hanger-on	24	Piece of coal fell down shaft	–	–	1	–	–	1
„ 20	67	Rothwell Haigh	Ditto	J. & J. Charlesworth	T. W. Rawling	Dayman	16	Fall of roof	–	1	–	–	–	1
„ 21	68	Helm	Huddersfield	Chas. Wheatley	Wm. Charlesworth	Deputy	48	Crushed by corves; died 27th Nov.	–	–	–	1	–	1
„ 22	69	Stanley Ferry	Wakefield	R. Hudson & Co.	Wm. Read	Hurrier	25	Crushed by corves	–	–	–	1	–	1
„ 23	70	High Elsecar	Barnsley	Earl Fitzwilliam	Richard White	Corf repairer	50	Crushed by machinery	–	–	–	–	1	1
								Total—November	–	4	4	2	3	13

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Dec. 4	71	Sharlston -	Normanton -	New Sharlston Coal Co. -	Jas. Stevenson -	Collier -	53	Fall of coal - - - -	–	1	–	–	–	1
„ 13	72	East Gawber -	Barnsley -	R. Craik & Co. - -	T. Sills - -	Driver -	16	Kicked by horse; died 17th Dec. -	–	–	–	1	–	1
„ 16	73	Scholes -	Bradford -	Crosland Coal Co. -	Jas. Myatt -	Collier -	31	Fall of roof - - - -	–	1	–	–	–	1
„ 20	74	Howdenclough	Leeds - -	Howdenclough Coal Co. -	Geo. Bennett -	Ditto -	34	Ditto - - - -	–	1	–	–	–	1
„ 20	75	Quarry House -	Halifax - -	Holmes & Stocks -	John Bastow -	Ditto -	46	Explosion of gas - - -	1	–	–	–	–	1
„ 21	76	Thrybergh Hall	Rotherham -	J. & J. Charlesworth -	John Brock -	Colliers	30	Fall of coal - - -	–	2	–	–	–	1
					John Adkin -		28							
								Total—December -	1	5	–	1	–	7
								Total for the Year 1878 -	4	39	5	22	10	80
						IRONSTONE.								
Jan. 22	1	Osmondthorpe	Leeds - -	Low Moor Iron Co. -	Benj. Baulderson -	Ironstone miner.	47	Fall of roof - - -	–	1	–	–	–	1
								Total in ironstone mines for the year 1878.	–	1	–	–	–	1
								Grand total in 1878 -	4	40	5	22	10	81

LIST of MINES classed under the COAL MINES REGULATION ACT, in MR. WARDELL'S DISTRICT, 1878.

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
1. W. Day, Barnsley	Agnes	Barnsley	J. Muckle	Coal.
2. Barrow Hæmatite Steel Co., Barnsley	Barrow	,,	Chas. Beevers	,,
3. T. W. Naylor, Darton, near Barnsley	Belle Vue	,,	T. W. Naylor	,,
4. Blacker Main Coal Co., Barnsley	Blacker Main	,,	G. Watson	,,
5. H. Lodge, Darton, near Barnsley	Bloomhouse Green	,,	R. Hay	,,
6. Yorkshire and Derbyshire Coal and Iron Co., Barnsley.	Carlton Main	,,	G. Jackson	,,
7. Corton Wood Coal Co., Barnsley	Corton Wood	,,	J. Greenhalgh	,,
8. J. Gooddy, Barnsley	Darfield Fire-clay Mine	,,	J. Goody	Fire-clay.
9. Darfield Main Coal Co., Darfield, near Barnsley.	Darfield Main	,,	G. L. Beacher	Coal.
10. Darley Main Coal Co., Barnsley	Darley Main	,,	J. Walton	,,
11. Thorp's Gawber Hall Co., Barnsley	Darton Hall	,,	G. J. Burnley	,,
12. Silkstone and Dodworth Coal and Iron Co., Higham, near Barnsley.	Dodworth	,,	J. Morte	,,
13. R. Craik & Co., Barnsley	East Gawber	,,	G. Sidebottom	,,
14. Leather and Littlewood, Havercroft, near Barnsley.	Ellis Laith	,,	R. Leather	,,
15. Edmunds Main Co., Barnsley	Edmunds Main	,,	B. Wilson	,,
16. Fountain and Son, Haigh, near Barnsley.	Haigh	,,	Jas. Auckland	,,
17. South Yorkshire Coal and Iron Co., Barnsley.	Hall Royd	,,	C. Scott	,,
18. High Stile Coal Co., Barnsley	High Stile	,,	Geo. E. Booth	,,
19. Hodroyd Coal Co., Havercroft, near Barnsley.	Hodroyd	,,	W. A. Hirst	,,
20. Wells & Co., Barnsley	Hoyland Silkstone	,,	P. Holt	,,
21. Houghton Main Coal Co., Darfield, near Barnsley.	Houghton Main	,,	O. Dyson	,,
22. Cherry, Barnsley	Hounds Hill	,,	Jas. Wood	,,
23. Joseph Sykes, Barnsley	Kidfield Nook	,,	Jos. Sykes	,,
24. Lundhill Coal Co., Barnsley	Lundhill	,,	J. Robinson	,,
25. Mitchell & Co., Barnsley	Mitchell Main	,,	J. Mitchell	,,
26. Monckton Main Co.	Monckton Main	,,	A. B. Southall	,,
27. Fountain and Son, Haigh, near Barnsley.	Moor House	,,	Jas. Auckland	,,
28. Monk Bretton Coal Co., Barnsley	Monk Bretton	,,	W. Hunter	,,
29. W. Day, Barnsley	Mount Osborne	,,	J. Muckle	,,
30. Thorp's Gawber Hall Coal Co., Barnsley.	North Gawber	,,	G. J. Burnley	,,
31. C. Cammell & Co., Barnsley	Oaks	,,	J. Wilson	,,
32. Senior Brothers, Barnsley	Oakwell	,,	A. Senior	,,
33. W. Day, Barnsley	Old Mill	,,	J. Muckle	,,
34. R. C. Clarke, Barnsley	Old Silkstone	,,	U. Mason	,,
35. Coopers & Co., Worsbro' Park, near Barnsley.	Old Silkstone Main	,,	M. Pickles	,,
36. Darley Main Coal Co., Barnsley	Pindar Oaks	,,	J. Walton	,,
37. T. A. Mann & Co., Rockley, near Barnsley.	Rockley	,,	R. S. L. Wheldon	Coal and ironstone.
38. Newton, Chambers, & Co., Hoyland, near Barnsley.	Rockingham	,,	C. Hodgson	,,
39. W. Day, Barnsley	Rosa	,,	J. Muckle	Coal.
40. Day and Co.	Silkstone Banks	,,		,,
41. Silkstone and Dodworth Coal and Iron Co., Higham, near Barnsley.	Silkstone	,,	J. Morte	,,
42. Samuel Brown, Barnsley	Flockton	,,	S. Brown	,,
43. C. Marsden and Son, Barnsley	Smithies	,,	J. C. Sutcliffe	,,
44. Stanhope Silkstone Colliery Co.	Stanhope Silkstone	,,	W. H. Chambers	,,
45. Edmunds Main Co., Barnsley	Swaithe Main	,,	B. Wilson	,,
46. Strafford Coal Co., Barnsley	Strafford	,,	R. Miller	,,
47. Willow Main Coal Co., Barnsley	Tingle Bridge	,,	R. W. Wordsworth	Sinking.
48. Fountain and Son, Barnsley	Underhill	,,	Jas. Auckland	Coal.
49. Sutcliffe & Co., Barnsley	Victoria	,,	A. Beacher	,,
50. Wharncliffe Silkstone Coal Co., Wortley, near Sheffield.	Wharncliffe Silkstone	,,	J. Peel	,,
51. Wharncliffe Woodmoor Coal Co., Carlton, near Barnsley.	Wharncliffe Woodmoor	,,	W. J. Brewer	,,

List of Mines in Mr. Wardell's District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
52. Thorp's Gawber Hall Coal Co., Barnsley.	Willow Bank	Barnsley	G. J. Burnley	Coal.
53. Haigh and Dyson, Barnsley	Winter Hill	,,	Chas. Dyson	,,
54. Wombwell Main Coal Co., Barnsley	Wombwell Main	,,	W. Gray	,,
55. Woolley Coal Co., Darton, near Barnsley.	Woolley	,,	W. H. Chambers	,,
56. Coopers & Co., Worsbro' Park, near Barnsley.	Worsbro' Park	,,	Jas. Hunter	,,
Total 56.				
1. J. Overend, Wood, & Co., Holling	Denholme	Bingley	Jonas Dobson	,,
2. Townend Brothers, Hazel Crook	,,	,,	J. Baxendell	,,
3. Briggs and Sons, Bingley	Shipley Moor	,,	J. S. Briggs	,,
4. Wood and Son, Bingley	Wilsden	,,	J. Dobson	,,
Total 4.				
1. E. Clayton, Thornton, near Bradford	Alderscholes	Bradford	E. Clayton	Coal.
2. Bowling Iron Co., Bowling, near Bradford.	Allerton	,,	F. Pearce	Coal and ironstone.
3. Wood and Son, Thornton, near Bradford.	,,	,,	J. Dobson	Coal.
4. Bowling Iron Co., Bowling, near Bradford.	Birkby Lane, Clifton	,,	F. Pearce	Coal and ironstone.
5. Ephraim Holliday, Tong, near Bradford.	Booth Holme	,,	E. Holliday	Coal.
6. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Bowling	,,	E. Woodhead	Coal and ironstone.
7. Jos. Beanland, Bradford	,,	,,	J. Beauland	,,
8. Bowling Iron Co., Bowling, near Bradford.	,,	,,	F. Pearce	,,
9. E. Gittins, Bradford	,,	,,	E. Gittens	Coal.
10. Bowling Iron Co., Bowling, near Bradford.	Bradford	,,	F. Pearce	Coal and ironstone.
11. Jos. Wood, Bradford	Bradford Moor	,,	J. Boocock	Coal.
12. Bowling Iron Co., near Bradford	,,	,,	F. Pearce	Coal and ironstone.
13. Thos. Pitts, Bradford	Broom Hall	,,	T. Pitts	Coal.
14. Bowling Iron Co., Bowling, near Bradford.	Bunker's Hill	,,	F. Pearce	Coal and ironstone.
15. Ditto	Cleckheaton	,,	,,	,,
16. Bowling Iron Co., Bradford	,,	,,	,,	,,
17. Hird, Dawson, and Hardy, Low Moor, near Bradford.	,,	,,	E. Woodhead	,,
18. Ditto	Clifton	,,	,,	,,
19. Ditto	Coates	,,	,,	,,
20. Ditto	Cutter Height	,,	,,	,,
21. Thos. Tomlinson, Low Moor, near Bradford.	Eccleshill	,,	T. Tomlinson	Coal.
22. Briggs and Son, Bradford	Heaton	,,	J. S. Briggs	,,
23. John R. Fyfe & Co., Bradford	Heaton (Shipley)	,,		Coal and fire-clay.
24. Asa Fawthrop, Clayton, near Bradford	Holebottom	,,	A. Fawthrop	Coal.
25. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Holme Bank	,,	E. Woodhead	Coal and ironstone.
26. Bowling Iron Co., Bowling, near Bradford.	Holme Tong	,,	F. Pearce	,,
27. Ditto	Hunsworth	,,	,,	,,
28. J. and R. Taylor, Cleckheaton, near Bradford.	Hunsworth Mills	,,		Sinking.
29. Jos. Cliffe and Sons, Laister Dyke, near Bradford.	Laister Dyke	,,	J. Feetham	Coal and fire-clay.
30. Holt, Thomas, and Healey, Cleckheaton, near Bradford.	Merchant Fields	,,	J. Lambert	Sinking.
31. Bowling Iron Co., Bowling, near Bradford.	North Bierley	,,	F. Pearce	Coal.
32. Hird, Dawson, and Hardy, Low Moor, near Bradford.	,,	,,	E. Woodhead	,,
33. Broadbent and Johnson, Tong, near Bradford.	Newmarket	,,	S. Broadbent	Coal and ironstone.
34. Hird, Dawson, and Hardy, Low Moor, Bradford.	Oakenshaw	,,	E. Woodhead	,,

LIST of MINES in MR. WARDELL'S DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
35. John Harrison, Birkenshaw, near Bradford.	Oakroyd	Bradford	J. Harrison	Coal.
36. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Pasture	„	E. Woodhead	Sinking.
37. Holt & Co., Cleckheaton, near Bradford.	Popplewell	„	J. Lambert	Coal.
38. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Rake Lands	„	E. Woodhead	Sinking.
39. Terry and Rushforth, Tong, near Bradford.	Red Hill	„	Wm. Rushforth	Coal.
40. Smith & Co., Bradford	Rockwell	„	- - -	„
41. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Rooks Hipperholme	„	E. Woodhead	Coal and ironstone.
42. Ditto	Scholes	„	„	„
43. Ditto	Shelf	„	„	„
44. Crosland Coal Co., Cleckheaton, near Bradford.	Scholes	„	E. Flathers	„
45. W. Firth, Shipley, near Bradford	Shipley Moor	„	W. Firth	Coal.
46. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Syke	„	E. Woodhead	Coal and ironstone.
47. Wood and Son, Thornton, near Bradford.	Thornton	„	J. Dobson	Coal.
48. D. Illingworth and Sons, Thornton, near Bradford.	„	„	- - -	„
49. Healey & Co., Birkenshaw, near Bradford.	Teftshaw Moor	„	J. Lambert	„
50. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Tong	„	E. Woodhead	„
51. Bowling Iron Co., Bowling, near Bradford.	„	„	F. Pearce	„
52. Squire Broadbent, Tong Street, Tong, near Bradford.	Tong Street	„	S. Broadbent	„
53. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Westfield	„	E. Woodhead	Sinking.
54. Ditto	Whitehall	„	„	Coal and ironstone.
55. John Tordoff, Wibsey, near Bradford	Wibsey Bank Foot	„	J. Tordoff	„
56. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Wike	„	E. Woodhead	Coal.
57. Mitchell Brothers	Wroe	„	- - -	„
Total 57.				
1. Crawshaw and Warburton, Dewsbury	Babes in the Wood	Dewsbury	G. F. Beacher	„
2. Raynor Brothers, Dewsbury	Bank Top	„	W. Smith	„
3. Jas. Critchley, Batley, near Dewsbury	Batley	„	W. Midgley	„
4. Isaac Colbeck	Brier-Birstal	„	I. Colbeck	„
5. Chas. Wheatley, Mirfield, Dewsbury	Calder	„	J. Armitage	„
6. Chickenley Heath Coal Co., Dewsbury	Chickenley Heath	„	- - -	„
7. Chickenley Wood Coal Co., Dewsbury	Chickenley Wood	„	Charles Cawthorne	Sinking.
8. Crawshaw and Warburton, Dewsbury	Chidswell	„	G. F. Beacher	Coal.
9. E. T. Ingham, Thornhill, near Dewsbury.	Combs	„	J. Taylor	„
10. John Holliday and Brothers, Batley, near Dewsbury.	Crossbank	„	H. Holliday	„
11. John Cutt, Briestfield, near Dewsbury	Howroyd	„	J. Cutt	Sinking.
12. G. and J. Haigh, Dewsbury	Dewsbury Moor	„	W. Haigh	Coal.
13. Jos. Bedford, Whitley, near Dewsbury	Falhouse	„	T. Bedford	„
14. Gregory Spring Coal Co., Mirfield	Gregory Spring	„	W. Barker	„
15. Hamath Fell, Briestfield, near Dewsbury	Heeley	„	Jas. Fell	„
16. Jos. Sheard, Mirfield, near Dewsbury	Hopton	„	J. Sheard	„
17. E. T. Ingham, Thornhill, Dewsbury	Hostingley	„	J. Taylor	„
18. Ditto ditto	Ings	„	„	„
19. J. Ashton, Hopton, near Mirfield	Knowl	„	J. Ashton	Sinking.
20. Chas. Wheatley, Mirfield, Dewsbury	Lady Wood	„	J. Armitage	„
21. Chas. Wheatley, Mirfield	Ledgard Bridge	„	„	Coal.
22. Nevin and Barraclough, Mirfield	Mirfield	„	Jas. Shires	„
23. Rhodes, Wright, and Wroe, near Dewsbury.	Park Farm, Heckmondwike.	„	R. Rhodes	„
24. G. and J. Haigh, Dewsbury	Ravens Lodge	„	W. Haigh	„
25. Crawshaw and Warburton, Dewsbury	Ridings	„	G. F. Beacher	„
26. Roach Coal Co., Batley	Roach	„	C. White	„

List of Mines in Mr. Wardell's District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
27. Crawshaw and Warburton, Dewsbury	Saville	Dewsbury	G. F. Beacher	Coal.
28. Ditto ditto	Shaw Cross	"	"	"
29. Ditto ditto	Soothill	"	"	"
30. J. Blakeley, Dewsbury	Soothill Wood	"	C. Cawthorne	"
31. Benjn. Barraclough, Mirfield	Upper Crosley	"	B. Barraclough	"
32. Chas. Wheatley, Mirfield	Whitley Wood	"	J. Armitage	"
33. E. Lockwood, Batley	Woodwell	"	E. Lockwood	Sinking.
Total 33.				
1. S. Illingworth and Sons	Brow End, Southowram.	Halifax		Coal.
2. Charlestoun Brick and Tile Co., Halifax.	Charlestown	"		Sinking.
3. Jos. Norton	Cinder Hill, Southowram.	"		Coal and fire clay.
4. Waddington and Holt, Halifax	Cinder Hills, Southowram.	"	J. Shore	Sinking.
5. R. Holt	Claremont	"		Coal and fire-clay.
6. M. Bottomley and Son, Shelf, near Halifax.	Cockhill Farm	"		Coal.
7. Robinson & Co., Elland, Halifax	Elland	"	S. Wilkinson	Coal and fire-clay.
8. Ellen Royd Brick Co.	Ellen Royd	"		"
9. Smith, Bros., Halifax	Exley	"		Sinking.
10. John Foster and Son, Queensbury, near Halifax.	Harp Bottom	"	J. F. Rushworth	Coal.
11. — Halliday	Howcans, Boothtown	"		Coal and fire-clay.
12. John Lister, Halifax	Lower Shibden	"	Wm. Crowther	Coal.
13. Julius Whitehead	New Bank	"		Coal and fire-clay.
14. Geo. Greenwood	"	"		"
15. Lutz and Armitage	New Hall	"		"
16. Norwood Green Coal Co., Halifax	Norwood Green	"	J. Shore	Coal.
17. Holmes & Co., Halifax	Quarry House	"	G. Booth	"
18. Joseph Briggs and Sons, Halifax	Queensbury	"	Wm. Briggs	"
19. Michael Stocks, Halifax	Shaw Lane	"	S. Sharp	"
20. Holmes & Co., Halifax	Shibden	"	G. Booth	"
21. John Lister, Halifax	Shibden Hall	"	W. Crowther	"
22. Michael Stocks, Halifax	Shibden Head	"	S. Sharp	"
23. Briggs and Sons, Halifax	Shipley Moor	"	J. S. Briggs	"
24. Ditto	Shugden	"	"	"
25. Michael Stocks, Halifax	Shugden Head	"	S. Sharp	"
26. T. S. Walsh, Ovenden, near Halifax	Soil Hill	"		"
27. Halifax Coal Co., Halifax	Sunny Bank	"	W. Crowther	"
28. J. and J. Farrar	Victoria, Elland	"		Coal and fire-clay.
29. Arthur Dawson, Southowram, near Halifax.	Walter Clough	"		Sinking.
30. J. Saville	White Gate	"		Fire-clay.
31. Edmund Kitson	Woodman Clay Mine, Elland.	"		Coal and fire-clay.
Total 31.				
1. Hirst and Lockwood, Hepworth, near Holmfirth.	Barnside	Holmfirth	Wm. Hirst	Coal.
2. C. S. and H. W. Tinker, Holmfirth	Clayworks	"	C. Rhodes	"
3. Ditto ditto	Gatehead	"	"	"
4. Hepworth Iron Co., New Mills, near Holmfirth.	Hepworth	"	R. Twain	"
5. Ditto	Hollin House	"	"	"
6. George Hinchliffe, Holmfirth	Knab	"		Sinking.
7. J. & A. Kaye, Hepworth	Knowles	"	A. Kaye	"
8. C. S. and H. W. Tinker, Holmfirth	Meal Hill	"	C. Rhodes	Fire-clay
9. Ditto ditto	Wood	"		Coal.
Total 9.				

LIST of MINES in MR. WARDELL'S DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
1. Seth, Senior, and Sons, Huddersfield	Box Ings	Huddersfield.	E. Rhodes	Coal.
2. Chas. Wheatley, Mirfield	Bradley Wood	,,	J. Armitage	,,
3. Messrs. Haigh, Huddersfield	Brockholes	,,	J. Haigh	,,
4. Matthews & Co., Shelley, near Huddersfield.	California	,,	-	,,
5. Norton Brothers & Co., Clayton West, near Huddersfield.	Clayton Common	,,	H. Helliwell	,,
6. J. Sheard, Huddersfield	Cowmes	,,	J. Sheard	,,
7. Schofield and Forbes, Huddersfield	Denby Dale	,,	H. Schofield	Sinking.
8. Norton Brothers & Co., Clayton West, near Huddersfield.	Duke Wood	,,	H. Helliwell	Coal.
9. E. Brooke & Sons, Huddersfield	Fellgreave	,,	E. Clifford	Sinking.
10. Edward Brooke, Huddersfield	Fieldhouse	,,	W. Taylor	Coal and fire-clay.
11. Guy Firth & Co.	German Main, Denby Dale.	,,	J. Harrison	Coal.
12. Jones and Waterhouse, Huddersfield	Grimescar	,,	R. Holroyd	,,
13. J. Alderson and Son, Shelley, near Huddersfield.	Greenhouse	,,	G. Brook	Sinking.
14. Chas. Wheatley, Mirfield	Helm	,,	Paul Priestley	Coal.
15. Messrs. Haigh, Huddersfield	Hollinhouse	,,	J. Haigh	,,
16. H. Lister	High Park, Bradley	,,	H. Hudson	,,
17. Messrs. Cardwell, Huddersfield	Kirkheaton	,,	G. Mellor	,,
18. E. Heeley & Co.	Lane End, New Mills	-	-	,,
19. G. Hey, Huddersfield	Linfit	,,	G. Hey	,,
20. Ed. Brook and Sons, Huddersfield	Lockwood Common	,,	W. Taylor	Coal and fire-clay.
21. James Schofield	Lower Cumberworth	,,	H. Schofield	Coal.
22. Pitt and Booth, Huddersfield	Lower Holmhouse	,,	E. Rhodes	Sinking.
23. Geo. Newsome, Highburton, near Huddersfield.	Moor Lane	,,	G. Newsome	Coal.
24. Ed. Brook and Sons, Huddersfield	New Ground	,,	W. Taylor	Coal and fire-clay.
25. W. & C. Hirst, Shelley	Ozzings	,,	G. Longley	Sinking.
26. J. Sheard, Huddersfield	Pease Close	,,	J. Sheard	Coal.
27. Mellor and Sanderson, Denby Dale, near Huddersfield.	Pulling Hill	,,	-	Sinking.
28. J. Sheard, Huddersfield	Rowley	,,	J. Sheard	Coal.
29. H. T. Beaumont, Huddersfield	Schrogg	,,	W. J. Dunderdale	Sinking.
30. Messrs. Haigh, Huddersfield	Sinking Wood	,,	J. Haigh	Coal.
31. John Haigh and Sons, Huddersfield	Snowgatehead	,,	,,	,,
32. W. Lodge & Co., Highburton, near Huddersfield.	Thorncliffe Green	,,	W. Lodge	Sinking.
33. Kempenny and Robinson, Huddersfield.	Thurstonland	,,	-	Coal.
34. John Hargrave & Co., Clayton West, near Huddersfield.	Toppit	,,	J. Hargrave	Sinking.
35. Messrs. Cardwell, Kirkheaton, near Huddersfield.	Whitley	,,	G. Mellor	Coal.
36. George Newsome, Kirkburton, near Huddersfield.	Wilson Main	,,	S. Fisher	Sinking.
Total 36.				
1. Levi Towler, Burton in Lonsdale	Greeta Main	Ingleton	L. Towler	Coal.
2. W. Bracewell, Ingleton	Ingleton	,,	E. Danson	,,
Total 2.				
1. Medcalf and Harrison, Adwalton, near Leeds.	Adwalton Common	Leeds	-	,,
2. Rushforth & Co., Adwalton, near Leeds.	Adwalton Lane	,,	-	,,
3. Bowers Allerton Coal Co., Woodlesford, near Leeds.	Allerton Main	,,	R. C. Aubrey	,,
4. Squire Broadbent, Adwalton, near Leeds.	Adwalton Moor	,,	S. Broadbent	Sinking.
5. Bowers Allerton Coal Co., Woodlesford, near Leeds.	Astley	,,	R. C. Aubrey	Coal.

List of Mines in Mr. Wardell's District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
6. W. Midgley, Leeds	Baildon Moor	Leeds	W. Midgley	Coal.
7. West Yorkshire Iron and Coal Co., West Ardsley, near Leeds.	Balaklava	,,	J. Oxnard	Coal and ironstone.
8. R. A. Sheard, Robertown, near Normanton.	Balm Gate	,,	S. Jowett	Sinking.
9. Holdsworth and Wilkinson, Potternewton, near Leeds.	Beckett Street	,,	J. Mammatt	,,
10. Wm. Morris	Beeston Hill	,,	-	,,
11. Farnley Iron Co., Farnley, near Leeds.	Briggs	,,	S. Robertshaw	Coal and ironstone.
12. Hird, Dawson, and Hardy, Beeston	Beeston	,,	H. Tempest	,,
13. W. Harrison's Executors, Birkenshaw, near Leeds.	Birkhill	,,	J. Harrison	Coal.
14. Joseph Holme, Birkenshaw, Bradford	Blue Hills	,,	J. Holme	,,
15. Benjamin North, Wortley, near Leeds.	Blue Hills Lane	,,	B. North	,,
16. Manston Coal Co., Manston, near Leeds.	Brown Moor	,,	A. Lupton	,,
17. Bruntcliffe Hill Coal Co., Morley, Leeds.	Bruntcliffe Hill	,,	-	Sinking.
18. Newmarket Coal Co., Drighlington, near Leeds.	Bushey	,,	J. H. Watson	Coal.
19. E. J. W. Waterhouse	Calder Lower Fireclay Mine, Elland.	,,	E. J. W. Waterhouse.	Fire-clay.
20. Woodhead's Executors, Leeds	Calverley	,,	-	Coal.
21. Hird, Dawson, and Hardy, Low Moor, near Bradford.	Churwell	,,	H. Tempest	Coal and ironstone.
22. William Ward, Churwell, near Leeds	,,	,,	W. Ward	,,
23. Farnley Iron Co., Farnley, near Leeds	Cliff	,,	S. Robertshaw	,,
24. E. Firth & Sons, Heckmondwike, near Leeds.	Cooke Lane	,,	E. Butler	Sinking.
25. Hird, Dawson, and Hardy, Low Moor, Bradford.	Cottingley Hall	,,	H. Tempest	Coal.
26. Hird, Dawson, and Hardy, Low Moor, Bradford.	Cross Flats	,,	,,	Coal and ironstone.
27. Bowling Iron Co., Bowling, near Bradford.	Cross Green	,,	F. Pearce	Coal.
28. Rhodes' Executors, Birstall, near Leeds.	Crow Trees	,,	R. Rhodes	Coal and ironstone.
29. Lister & Co., Morley, Leeds	Dartmouth	,,	B. Keightley	Coal.
30. Bedford & Co., Morley, Leeds	Dean Hall	,,	G. Bedford	,,
31. Farnley Iron Co., Farnley, Leeds	Dixon	,,	S. Robertshaw	Coal and ironstone.
32. Doleswood Coal Co., Drighlington, Leeds.	Doleswood	,,	T. Gibson	Coal.
33. Ed. Brooke and Sons, Elland, Leeds	Elland Park	,,	-	Sinking.
34. J. Towler, Leeds	Elland Road	,,	J. Towler	,,
35. Wortley Fire-clay Co., Leeds	,,	,,	G. Thornton	Coal and fire-clay.
36. Farnley Iron Co., Farnley, Leeds	Farnley	,,	S. Robertshaw	Coal and ironstone and fire-clay.
37. A. Rogers and Son, Leeds	Farnley Wood	,,	-	Coal.
38. William Wood, Methley, Leeds	Foxholes	,,	T. Embleton, jun.	,,
39. Garforth Coal Co., Garforth, Leeds	Garforth	,,	R. Tate	,,
40. William Ward, Churwell, Leeds	Geldard Road	,,	W. Ward	,,
41. Clayton and Speight, Leeds	Gelderd Road, Gildersome.	,,	-	,,
42. T. C. Taylor & Co., Leeds	Gomersal Main	,,	R. Lambert	,,
43. Joshua Taylor, Leeds	,,	,,	J. W. Furness	,,
44. Robinson & Co., Hunslet, Leeds	Green Man	,,	-	,,
45. B. Canthery, Pudsey, Leeds	Green Top	,,	-	Sinking.
46. Smith & Co., Rawden, Leeds	Greville	,,	-	Coal.
47. W. Wormald, Leeds	,,	,,	W. Wormald	Coal and fire-clay.
48. W. Woodhead & Son	Grove, Farnley	,,	W. Woodhead	Sinking.
49. Holly Park Mills Co.	Holly Park, Calverley	,,	J. Taylor	Coal.
50. Garforth and Townsend, Adwalton, Leeds.	Horse Riggs	,,	-	,,
51. Howdenclough Coal Co., Leeds	Howdenclough	,,	J. Burgoyne	,,
52. Howley Park Coal Co., Batley, Leeds	Howley Park	,,	J. Taylor	,,
53. G. W. Hick, Leeds	Hunslet Carr	,,	-	Sinking.
54. F. B. Ellison, Leeds	Idle	,,	F. B. Ellison	,,
55. Farnley Iron Co., Farnley, Leeds	Ingham	,,	S. Robertshaw	Coal.

LIST of MINES in MR. WARDELL'S DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
56. Trustees of James Kellett - -	Joan Royd, Heckmondwike.	Leeds -	B. Beecroft -	Coal.
57. York Road Coal and Iron Co., Leeds -	Killingbeck - -	„ -	W. Dakers -	Coal, ironstone, and fire-clay.
58. Locke & Co., Leeds - - -	Kippax - -	„ -	W. Wilson -	Coal.
59. Samuel Jackson, Gomersal, Leeds -	Lanes Wood -	„ -	- - -	„
60. Crowther & Co., Leeds - -	Little Gomersal -	„ -	- - -	„
61. Holliday & Brooksbank, Gildersome -	Lodge - -	„ -	- - -	Sinking.
62. John Mann, Liversedge, Leeds -	Lumb Lane - -	„ -	J. Mann -	„
63. Doleswood Coal Co., Drighlington, Leeds.	Lumb Wood - -	„ -	T. Gibson -	Coal.
64. Manston Coal Co., Manston, Leeds -	Manston - -	„ -	A. Lupton -	„
65. Manston Coal Co., Manston, Leeds -	Manston Lodge -	„ -	„ - -	„
66. Whitaker & Roberts, Churwell -	Mary - -	„ -	C. Roberts -	Sinking.
67. J. Cliff & Sons, Micklefield, Leeds -	Micklefield - -	„ -	C. Houfton -	Coal.
68. Middleton Coal Co., Middleton, Leeds	Middleton - -	„ -	- - -	„
69. C. Waterhouse, Leeds - -	Middleton Main, Gomersal.	„ -	C. Waterhouse -	Sinking.
70. Harding & Co., Beeston, Leeds -	Morley - -	„ -	- - -	Coal.
71. W. Ackroyd and Brothers, Morley, Leeds.	Morley Main -	„ -	J. Pattison -	„
72. Morley West End Coal Co., Leeds -	Morley, West End -	„ -	J. H. Haigh -	„
73. Bedford and Rushforth, Gildersome, Leeds.	Moorland - -	„ -	- - -	Sinking.
74. H. Harrison, Leeds - - -	Moortown - -	„ -	- - -	„
75. Alfred West, Leeds - - -	Muffitt Lane -	„ -	A. West -	Coal.
76. Norwegian Titanic Iron Co., Leeds -	Neville Hill - -	„ -	G. Broadhead -	Coal and ironstone.
77. Grosvenor and Son, Middleton, Leeds	New Hall - -	„ -	E. Oldroyd -	Coal.
78. J. H. Watson, Adwalton, Leeds -	Newmarket - -	„ -	J. H. Watson -	Coal and fire-clay.
79. Joseph Cooper, Drighlington, Leeds -	Nethertown - -	„ -	- - -	Sinking.
80. W. Ackroyd and Brothers, Morley, Leeds.	Oakwell - - -	„ -	J. Pattison -	Coal.
81. John Taylor, Robert Town - -	Old Hall - -	„ -	J. Taylor -	Sinking.
82. Hird, Dawson, and Hardy, Low Moor, Bradford.	Osmondthorpe -	„ -	G. Foster -	Coal.
83. Park Coal Co., Liversedge, near Leeds	Park - -	„ -	J. Fletcher -	„
84. Leeds Patent Brick Co., Dolly Lane, Leeds.	Primrose - -	„ -	C. B. Hill -	Sinking.
85. T. H. Jackson, Liversedge, Leeds -	Primrose Hill -	„ -	T. Jackson -	Coal.
86. F. Sheard - -	Prospect, Roberttown	„ -	G. Johnson -	Sinking.
87. W. & J. Harris, Leeds - -	Pudsey - -	„ -	- - -	„
88. Jos. Wright, Liversedge, Leeds -	Quaker Lane -	„ -	J. S. Wright -	Coal.
89. Clayton and Speight, Leeds - -	Ravels, Beeston Royds.	„ -	- - -	Sinking.
90. Mann & Co., Roberttown, Normanton.	Roberttown -	„ -	J. Mann -	Coal.
91. Parkin & Co., Roberttown, Normanton.	„ - -	„ -	B. Hanson -	„
92. J. & J. Charlesworth, Rothwell Haigh, Leeds.	Robin Hood -	„ -	W. Keightley -	Coal and ironstone.
93. Wilcock & Co., Bumantofts, Leeds -	Rock - -	„ -	M. Towler -	Coal, ironstone, and fire-clay.
94. J. & J. Charlesworth, Rothwell Haigh, Leeds.	Rothwell Haigh -	„ -	Jas. Hargreaves	Coal and ironstone.
95. Farnley Iron Co., Farnley, Leeds -	Royds - -	„ -	S. Robertshaw -	„
96. Executors of W. Harrison, Gomersal, Leeds.	Scotland - -	„ -	J. Harrison -	Coal.
97. Manston Coal Co., Manston, Leeds -	Seacroft - -	„ -	A. Lupton -	„
98. Alfred West, Birstall, Leeds - -	Smithies - -	„ -	A. West -	„
99. Fearnley Garforth, Drighlington, Leeds.	Spring Gardens -	„ -	F. Garforth -	„
100. Stanley Coal Co., Liversedge, Leeds	Stanley Main -	„ -	W. H. Sharp -	„
101. Liversedge Coal Co., Liversedge, Leeds.	Strawberry Bank -	„ -	W. Marshall -	„
102. E. Heeley, Leeds - - -	Street Lane, Gildersome.	„ -	E. Heeley -	Sinking.
103. Leathby and Hartley, Leeds - -	Street Lane, Gildersome.	„ -	R. Leathby -	„
104. W. Harrison's Executors, Birkenshaw, near Leeds.	Sunny Bank, Birkenshaw.	„ -	J. Harrison -	Coal.

List of Mines in Mr. Wardell's District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
105. Reddick, Drighlington, Leeds	Sykes	Leeds	T. Reddick	Coal.
106. Tanhouse Mill Co., Liversedge, Leeds.	Tanhouse Mill	,,	- - -	,,
107. Farnley Iron Co., Farnley, Leeds	Tingle	,,	S. Robertshaw	Coal and fire-clay.
108. Healey & Petty, Birkenshaw, Leeds	Tong Moor	,,	J. Lambert	Coal.
109. Messrs. Haigh, Morley, Leeds	Victoria	,,	J. Haigh	,,
110. J. Towler, Birstall, Leeds	,,	,,	J. Towler	,,
111. Waterloo and Woodlesford Coal Co., Woodlesford, Leeds.	Waterloo	,,	J. W. H. White	,,
112. John T. Leather, Leeds	Waterloo Main	,,	W. Pickersgill	,,
113. J. Bastow	Webster, Adwalton	,,	T. Baistow	,,
114. J. Jackson and Son, Leeds	Wellington	,,	- - -	,,
115. J. Jackson and Son, Gomersal, Leeds	West Lane	,,	J. Foster	Sinking.
116. Manston Coal Co., Manston, Leeds	West Yorkshire	,,	A. Lupton	Coal.
117. Farnley Iron Co., Farnley, Leeds	White	,,	S. Robertshaw	Coal and ironstone.
118. York Road Iron and Coal Co., York Road, Leeds.	White Horse	,,	W. Dakers	Coal, ironstone, and fire-clay.
119. Alfred West, Leeds	White Lee	,,	A. West	Coal.
120. Rushforth & Co.	Wire Hall, Adwalton	,,	- - -	,,
121. Ingham and Son, Wortley, Leeds	Wortley	,,	W. Ingham	Coal, ironstone, and fire-clay.
122. Cliff and Son, Wortley, Leeds	,,	,,	J. Feetham	,,
123. Robinson and Clayton, York Road, Leeds.	York Road	,,	- - -	Coal and ironstone.
Total 123.				
1. H. Briggs, Son, and Co., Normanton	Don Pedro	Normanton	W. Bruton	Coal.
2. Do.	Goodhope	,,	,,	,,
3. Pope and Pearson, Normanton	Haigh Moor	,,	J. Fisher	,,
4. H. Briggs, Son, & Co., Normanton	,,	,,	W. Bruton	,,
5. Do.	Methley Junction	,,	W. G. Jackson	,,
6. Do.	Saville	,,	,,	,,
7. Do.	Silkstone	,,	W. Bruton	,,
8. Locke & Co., Normanton	St. John's	,,	J. Holliday	,,
9. Pope and Pearson, Normanton	West Riding	,,	J. Fisher	,,
Total 9.				
1. J. Hinchliffe & Co., Penistone	Bullhouse	Penistone	J. Hinchliffe	,,
2. Do.	Crowedge	,,	,,	,,
3. John Hinchliffe, Penistone	Flash House	,,	,,	,,
4. J. Hinchliffe & Co., Penistone	Middlecliffe	,,	,,	,,
Total 4.				
1. Silkstone and Haigh Moor Coal Co., Castleford.	Allerton Bywater	Pontefract	J. W. H. White	,,
2. Featherstone Coal Co., Pontefract	Featherstone	,,	Ernest Andrews	,,
3. Geo. Bradley, Castleford	Featherstone Manor	,,	Peter Hall	Sinking.
4. J. R. Fosdick, Pontefract	Fitzwilliam Main, Hemsworth.	,,	J. Bennett	,,
5. Frystone Coal Co., Castleford	Frystone	,,	J. Simpkin	,,
6. Executors of J. D. Thorp, Castleford	Glass Houghton	,,	S. J. Priestley	Coal.
7. Lindley and Brook	Neveson's Leap	,,	- - -	Sand.
8. J. H. Garbutt, Castleford	Newton Main	,,	J. Robinson	Coal.
9. Rhodes and Dalby, Pontefract	Prince of Wales	,,	J. Eley	,,
10. Do.	Snydale	,,	,,	,,
11. South Kirkby Coal Co., Pontefract	South Kirkby	,,	J. Morrison	Sinking.
12. H. Briggs, Son, & Co., Normanton	Streethouse	,,	W. Bruton	Coal.
13. Wheldale Coal Co., Castleford	Wheldale	,,	J. Mammatt	,,
Total 13.				

List of Mines in Mr. Wardell's District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
1. L. Horner & Co., Skipton -	Bradley - - -	Skipton -	- - -	Sinking.
2. M. Brown, Pateley Bridge -	Fogshaw, Middlesmoor.	Pateley Bridge.	M. Brown -	Coal.
3. W. Lambert, Threshfield, Skipton -	Threshfield - -	Grassington	W. Lambert -	,,
4. Matthew Dolphin, Pateley Bridge -	Woogill, Middlesmoor.	Pateley Bridge.	T. Dolphin -	,,
Total 4.				
1. John Brown & Co., Rotherham -	Aldwarke Main -	Rotherham	C. E. Rhodes -	,,
2. Mark Davy & Co., Rotherham -	Butterthwaite -	,, -	H. Davy -	,,
3. John Brown & Co., Rotherham -	Car House -	,, -	C. E. Rhodes -	,,
4. Denaby Main Coal Co., Masbro', Rotherham.	Denaby Main -	,, -	J. Warburton -	,,
5. Earl Fitzwilliam, Elsecar, Barnsley -	Elsecar - -	,, -	J. Hartop -	Coal and ironstone.
6. Rothervale Coal Co., Rotherham -	Fence - -	,, -	J. Prentice -	Coal.
7. Chambers & Son, Rotherham -	Grange - -	,, -	M. Davy -	,,
8. Hinchliffe, Brämham, & Co., Rotherham	Greasbrough -	,, -	G. L. Beacher -	,,
9. J. W. Beevers, Rawmarsh - -	Green Lane - -	,, -	J. Hawkins -	,,
10. E. Hart & Co., Rawmarsh, Rotherham	Greenfield -	,, -	E. Hart -	,,
11. Rotherham, Masbro', & Holmes Coal Co., Rotherham.	Holmes - -	,, -	T. Stubbs -	,,
12. Moses Law, Kimberworth, Rotherham	Jordan - -	,, -	A. Allott -	Sinking.
13. J. and J. Charlesworth, Rotherham -	Kilnhurst - -	,, -	G. J. Kell -	Coal.
14. Jos. Warris, Rotherham - -	Kimberworth - -	,, -	- - -	Sinking.
15. Earl Fitzwilliam, Rotherham -	Low Stubbin -	,, -	J. Hartop -	Coal.
16. Manvers Main Co., Mexbro', Rotherham	Manvers Main -	,, -	J. F. Thompson	,,
17. Hawkins, Hague, & Twigg, Rawmarsh	Netherfield - -	,, -	J. Hawkins -	,,
18. Milton and Newhill Coal Co, Wath, Rotherham.	Newhill - -	,, -	S. Swift -	,,
19. Rothervale Coal Co. - -	Orgreave - -	,, -	J. Prentice -	,,
20. Earl Fitzwilliam, Elsecar, Barnsley -	Park Gate - -	,, -	J. Hartop -	Coal and ironstone.
21. J. Knapton, Rotherham - -	Rawmarsh -	,, -	J. Knapton -	Coal.
22. Thomas Smith - - - - -	Rawmarsh - -	,, -	T. Smith -	,,
23. Cooper, Sellars, & Co., Rotherham -	Roundwood - -	,, -	J. Hargreaves -	,,
24. Mangham & Co. - - - -	Scholes - -	,, -	Jno. Mangham -	,,
25. J. and J. Charlesworth, Rotherham -	Thrybergh Hall -	,, -	J. Outram -	,,
26. Rothervale Coal Co. - -	Treeton - -	,, -	J. Prentice -	,,
27. Benjamin Huntsman, Rotherham -	Tinsley Park -	,, -	H. Chambers -	,,
28. Skinner and Holford, Beighton, Sheffield.	Waleswood -	,, -	J. Holford -	,,
29. J. and J. Charlesworth, Rotherham -	Warren Vale -	,, -	G. J. Kell -	,,
30. Wath Main Coal Co., Wath, Rotherham	Wath Main - -	,, -	G. Shaw -	,,
31. W. Law Liversedge, Melton, Rotherham.	West Melton -	,, -	W. Smith -	,,
Total 31.				
1. E. Brooke and Son - - -	Alumina, Oughtibridge	Sheffield	J. Dean -	,,
2. W. H. Stone, Aston, Sheffield -	Aston Main -	,, -	W. H. Stone -	,,
3. Skinner and Holford, Beighton, Sheffield.	Beighton - -	,, -	J. Holford -	,,
4. Bramhall and Son - - -	Birkin, Oughtibridge	,, -	- - -	,,
5. Executors of Jas. Grayson, Deepcar, Sheffield.	Bracken Moor -	,, -	A. Dyson -	,,
6. John Denton & Co., Sheffield -	Brightside - -	,, -	J. Leigh -	,,
7. Bromley Silkstone Coal Co., Wortley, Sheffield.	Bromley Main -	,, -	G. Sidebottom -	,,
8. J. Helliwell, Sheffield - -	Busk Flatt - -	,, -	J. Helliwell -	Sinking.
9. H. Wastenedge, Chapeltown, Sheffield	Chapeltown - -	,, -	H. Wastenedge -	Coal.
10. Jas. Grayson, Deepcar, Sheffield -	Clough - -	,, -	J. Grayson -	,,
11. J. Gregory, Deepcar - - -	,, - -	,, -	J. Gregory -	Sinking.
12. Grayson, Lowood, & Co., Deepcar, Sheffield.	Deepcar - -	,, -	Jas. Gregory -	Coal and ironstone and clay.
13. John Armitage, Sheffield - -	,, - -	,, -	M. Gibson -	Coal.
14. Haigh & Co., Sheffield - -	Dungworth -	,, -	J. Ibbotson -	,,
15. J. Lloyd, Shheffield - - -	Eccleshall - -	,, -	J. Lloyd -	Sinking.
16. Thos. Ward & Co., Sheffield -	Gleadless, Normanton Spring.	,, -	T. Ward -	,,

List of Mines in Mr. Wardell's District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
17. John Denton & Co., Sheffield	Grimesthorpe	Sheffield	J. Leigh	Coal.
18. C. Marsden, Stannington	Hall Park	,,	C. Marsden	Sinking.
19. Jos. Hattersley, Bolterstone, Sheffield	Holly Bush	,,	J. Hattersley	Coal.
20. John Gregory and Son, Sheffield	Hurlfield	,,	Jno. Gregory	Sinking.
21. —— Morgan	Kirkedge, Bradfield	,,	- - -	Coal.
22. Kiveton Park Coal Co., Kiveton Park, Sheffield.	Kiveton Park	,,	T. Carrington	,,
23. Geo. Siddon	Low Ash, Worral	,,	- - -	,,
24. J. Johnson, Sheffield	Lower Wincobank	,,	J. Johnson	,,
25. Thos. Wragg	Loxley	,,	- - -	,,
26. Grayson, Lowood, & Co., Sheffield	Malin Bridge	,,	J. Gregory	Coal and ironstone.
27. Nunnery Colliery Co., Sheffield	Manor	,,	E. Bainbridge	Coal.
28. T. W. Roome, Sheffield	Meadow Fire-clay Mine.	,,	T. W. Roome	Sinking.
29. Mark Davy, Sheffield	Meadow Hall	,,	H. Davy	,,
30. John Lee, Sheffield	Midhope Stones	,,	J. Lee	,,
31. G. Longden & Son, Neepsend	Myers Lane	,,	G. Beeley	,,
32. Nunnery Colliery Co., Sheffield	New Winning	,,	E. Bainbridge	Coal.
33. Staveley Coal and Iron Co., Sheffield	North Staveley	,,	J. Humble	,,
34. M. Law, High Green, Sheffield	Potter Hill	,,	A. Allott	Sinking.
35. Benjn. Jackson, Bolsterstone, Sheffield	Shaw House	,,	B. Jackson	Coal.
36. Benjamin Huntsman, Sheffield	Sheffield	,,	H. Chambers	,,
37. Mrs. Grayson, Deepcar, Sheffield	Spink Hall	,,	- - -	,,
38. Darwent, Brothers	Spring Wood, Ecclesfield.	,,	- - -	,,
39. Grayson, Lowood, & Co., Sheffield	Stannington	,,	J. Gregory	Coal and fire-clay.
40. Nichols and Jackson	Stannington Wood	,,	Jno. Nichols	Coal.
41. Russell & Co., Oughtibridge, Sheffield	St. Davids	,,	- - -	,,
42. Samuel Fox & Co., Deepcar, Sheffield	Stockbridge	,,	T. Marshall	Coal and fire-clay.
43. Marshall and Crapper	Storrs Bridge, Loxley	,,	- - -	Coal.
44. Newton, Chambers, & Co., Chapeltown, Sheffield.	Tankersley	,,	A. Chambers	Coal and ironstone.
45. Ditto	Thorncliffe	,,	,,	,,
46. E. Swift, Sheffield	Vernon Silkstone	,,	E. Swift	Sinking.
47. Jonathan Dyson	Wadsley	,,	J. Dyson	Coal.
48. J. Beaumont, Oughtibridge, Sheffield	Wharncliffe	,,	J. Beaumont	Coal and clay.
49. Brooke and Green, Oughtibridge, Sheffield.	Wharncliffe Wood	,,	J. Dean	Coal and clay and ironstone.
50. John Crowley & Co., Sheffield	Wincobank	,,	W. Austin	Coal.
51. Nunnery Colliery Co., Sheffield	Woodthorpe	,,	E. Bainbridge	,,
52. Andrews & Co., Sheffield	Wortley, Silkstone	,,	J. Matthewman	,,
Total 52.				
1. Messrs. Haigh, Wakefield	Alverthorpe	Wakefield	W. Haigh	,,
2. J. and J. Charlesworth, Lofthouse, Wakefield.	Bottom Boat	,,	W. Hargreaves	,,
3. Miss E. Lister Kaye, Wakefield	Denby Grange	,,	J. O. Greaves	,,
4. East Ardsley Co-operative Coal Co., Wakefield.	East Ardsley	,,	- - -	,,
5. R. Holliday & Sons, Wakefield	,,	,,	C. Holliday	,,
6. Messrs. Jaggar, Wakefield	Emley Moor	,,	J. Rothery	,,
7. Edward Stringer, Wakefield	Emley Park	,,	E. Stringer	,,
8. Stansfeld & Co., Wakefield	Emroyd	,,	J. Wood	,,
9. Miss E. Lister Kaye, Wakefield	Flockton	,,	J. O. Greaves	,,
10. Stansfeld & Co., Wakefield	,,	,,	J. Wood	,,
11. Lockwood & Co., Wakefield	,,	,,	S. Metcalfe	,,
12. Beacher and Jarvis, Overton, Wakefield.	,,	,,	G. F. Beacher	,,
13. G. and J. Haigh, Wakefield	Gawthorpe	,,	W. Haigh	,,
14. Jesse Jaggar, Wakefield	Grange Ash	,,	J. Jaggar	,
15. Stansfeld & Co., Wakefield	Grange Moor	,,	J. Wood	,,
16. B. Lockwood, Wakefield	,,	,,	S. Metcalfe	
17. Flockton Coal Co., Netherton, Wakefield.	Hartley Bank	,,	G. F. Beacher	,,
18. E. Sutcliffe & Son, Wakefield	Havercroft Main	,,	J. C. Sutcliffe	,,
19. Hinchliffe, Kilner, & Co., Wakefield	Healy Lane, Ossett	,,	Henry Slater	,,

LIST of MINES in MR. WARDELL'S DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Manager or Agent.	Remarks.
20. Cliff Coal and Fire-clay Co., Crigglestone, Wakefield.	Hollingthorpe -	Wakefield	G. F. Beacher -	Coal.
21 R. Brown - - - -	Hope, Flockton -	„ -	R. Brown -	„
22. John Roberts, Upper Whittey, Wakefield.	Hunt Royal -	„ -	J. Roberts -	„
23. J. and A. Jaggar, Horbury -	Jenkin Bank - -	„ -	- - -	Sinking.
24. Leeds and Yorkshire Co-operative Co., Wakefield.	Lofthouse -	„ -	M. Hall -	„
25. J. and J. W. Woodhead, Wakefield -	Manor - -	„ -	W. Dakers -	Coal.
26. A. Brooke, Wakefield - -	Netherton - -	„ -	W. Kellett -	„
27. J. and J. Charlesworth, Wakefield -	Newmarket - -	„ -	W. Hargreaves -	„
28. Rowland Winn, M.P., Nostell, Wakefield.	Nostell -	„ -	J. Roseby -	„
29. G. and J. Haigh, Wakefield - -	Ossett - -	„ -	W. Haigh -	„
30. Ossett Flockton Coal Co., Ossett, Wakefield.	Oxclose - -	„ -	A. Jackson -	Sinking.
31. G. and J. Haigh, Wakefield -	Park Lane, Ossett -	„ -	W. Haigh -	Coal.
32. John Naylor & Co., Ossett, Wakefield.	Pildacre - -	„ -	M. Brooke -	„
33. G. and J. Haigh, Wakefield - -	Ravensthorpe -	„ -	W. Haigh -	„
34. Terry, Greaves, & Co., Wakefield -	Roundwood - -	„ -	J. Day - -	„
35. H. Lodge, Wakefield - -	Ryhill - -	„ -	R. Hay - -	„
36. Geo. Bailey, Wakefield - -	St. John's -	„ -	T. Embleton, jun.	„
37. New Sharlston Coal Co., Wakefield -	Sharlston - -	„ -	J. Tupman -	„
38. Hargreaves & Co., Wakefield -	Snapethorpe -	„ -	M. Brooke -	„
39. R. Hudson & Co., Wakefield -	Stanley - -	„ -	J. O. Greaves -	„
40. Sir J. L. L. Kaye, Bart., Wakefield -	Stocksmoor -	„ -	„ -	„
41. R. Hudson & Co., Wakefield -	Victoria - -	„ -	„ -	„
42. Walton Coal Co., Wakefield - -	Walton - -	„ -	- - -	Sinking.
43. Joshua Wilby, Ossett, Wakefield -	West Field - -	„ -	R. Pickard -	Coal.
44. J. Naylor & Co., Wakefield - -	Westgate Moor -	„ -	M. Brooke -	„
45. John Naylor & Co., Ossett, Wakefield.	Whinny Moor -	„ -	„ -	„
46. G. Sheard, East Ardsley, Wakefield -	Woodhouse Lane -	„ -	G. Sheard -	Sinking.
47. J. and J. Charlesworth, Wakefield -	Woodmoor - -	„ -	- - -	Coal.
48. Woodmoor Coal Co., Crigglestone, Wakefield.	„ - -	„ -	J. Sheard	„
49. Overend and Flint, Crigglestone -	Woollen Well Main -	„ -	J. K. Flint -	„
50. D. Micklethwaite & Co., Wakefield -	Wrenthorpe -	„ -	T Embleton, jun.	„
Total 50.				
515 Total Collieries in Yorkshire.				

LINCOLNSHIRE.

1. Cliff and Sons, Leeds - -	Appleby - -	Brigg -	F. Walshaw -	Ironstone.
2. West Yorkshire Coal and Iron Co., Leeds.	Claxby - -	Lincoln -	J. G. Carr -	„
3. Chas. Winn, Frodingham -	Frodingham - -	Brigg -	J. Roseby -	„
4. Cliff and Sons, Frodingham - -	„ - -	„ -	F. Walshaw -	„
5. Park Gate Iron Co., Frodingham -	„ - -	„ -	- - -	„
6. Mid-Lincolnshire Iron Co. -	Greetwell - -	Lincoln -	B. Ramsden -	„
7. Kiveton Park Co., Kiveton Park -	Kirton - -	Brigg -	- - -	„
8. Mid-Lincolnshire Iron Co. -	Monk's Abbey -	Lincoln -	B. Ramsden -	„
9. W, H. and G. Dawes - -	Scunthorpe - -	Brigg -	- - -	„
10. Ditto ditto - -	Trent - -	„ -	- - -	„

10 Total Collieries in Lincolnshire.
515 „ „ „ Yorkshire.

Total - 525

Mr. Wardell's Report.

REPORT on the WORKING of the METALLIFEROUS MINES REGULATION ACT, 1872, (35 & 36 VICT. c. 77.)—By FRANK N. WARDELL, Esq., F.G.S.

SIR, Wath, near Rotherham, March 1879.

I HAVE the honour to lay before you my report as an Inspector of Metalliferous Mines for the year ending 31st December 1878.

The number of deaths, which in the previous year was four, is reduced this year, I am happy to say, by two.

I trust the requirements of the Act are becoming gradually better known and understood, although a large proportion of the mines in this district are very difficult of access, lying far away, over moorlands, and at considerable distances from railways. At these places, as can be imagined, operations are conducted in a somewhat crude manner, and the appliances are of a rough description.

The establishment of special rules is optional under the Act, and I have hitherto not been able to induce the owners and managers to draw up a code. In the course of time, however, this may be accomplished, and I feel sure the usefulness of such rules would soon be proved.

The amount of mineral produced was less by 29,683$\frac{16}{20}$ tons than the previous year, the totals being, for 1877, 104,654$\frac{10}{20}$ tons, and for 1878, 74,970$\frac{14}{20}$ tons.

This reduction is considerable, and I cannot account for it in any way but as the result of depression of trade.

Notwithstanding, the number of persons employed is in excess of that the year before, the totals being for the two years 1,461 and 1,569 respectively; so that whilst in 1877 the proportion was 72 tons raised per person employed, in 1878 it was only 48 tons.

The number of boys under 13 years of age who were employed was 17, the whole number of young persons under the age of 18 being 146, of whom two were engaged underground.

The first fatality which occurred at these mines during the year was on the 18th April. A man named Joseph Jagger, a stone miner, was killed in the shaft of a mine called Broad Oak, near Halifax, the property of Messrs. C. and J. Goodyear.

Jagger, and four other men were descending the shaft by means of a ladder—this is the usual mode of ingress and egress in these mines—he being the last of the party. After descending a few feet, he suddenly fell to the bottom, dying about two hours afterwards, and never having spoken after his fall.

It seems he had been in the habit, for several weeks, of going up and down the ladder daily. The shaft was about 30 yards in depth and 9 feet in diameter. The ladder is perpendicular, and about 25 yards long, there being a movable portion used for the remaining 5 yards at the bottom of the shaft. The shaft itself and the ladder appeared to be in order and good working condition, and as it was stated that Jagger had in his youth been subject to fits, which had left him not very strong in the hands, it was natural to conclude that this or a sudden attack of faintness or giddiness was the cause of his falling. He was 21 years of age.

A man of the name of Samuel Barker was killed in a stone mine called Guyscliffe, near Pateley Bridge, on the 24th June. This death was occasioned by a fall of roof, but there do not seem to me to be any particular circumstances connected therewith to which I need draw your attention, neither is there anything further with respect to the working of the Act to which I have now to refer.

I have, &c.,
FRANK N. WARDELL.

The Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State.

LIST of MINES where Fatal Accidents have taken place during 1878.

Owner's Name.	Name of Mine.	Deaths.
C. and J. Goodyear - - -	Broad Oak, near Halifax - - -	1
———	Guyscliffe, near Pateley Bridge - -	1
	Total - - -	2

Mines classed under the Metalliferous Mines Regulation Act.

No. 1. Summary of Persons employed in and about the Mines, and quantity of Mining Produce in the Yorkshire and Lincolnshire District in the Year 1878.

Situation of Mines.	Inspector's District.	Underground. Male Persons. Ages 12 to 13.	Ages 13 to 16.	Ages above 16.	Total.	Above ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total underground and above ground.	Kind of Mines.	Mining Produce. Tons.	Cwt.	Qrs.	Lbs.	Remarks.
Appletreewick	F. N. Wardell	—	—	45	45	—	—	3	—	—	12	15	60	Lead	412	10	—	—	
Appletreewick Gill Head	,,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Blayshaw Gill	,,	—	—	7	7	—	—	—	—	—	—	—	7	,,	—	—	—	—	
Birkhill	,,	—	—	6	6	—	—	—	—	—	2	2	8	,,	12	—	—	—	
Cononley	,,	—	—	6	6	—	—	—	—	—	1	1	7	,,	—	—	—	—	
Dry Gill	,,	—	—	4	4	—	—	—	—	—	—	—	4	,,	—	—	—	—	
Elbolton	,,	—	—	2	2	—	—	—	—	—	—	—	2	,,	4	—	—	—	
Foley Gill	,,	—	—	—	—	—	—	—	—	—	—	—	—	,,	—	—	—	—	
Grimwith	,,	—	—	—	—	—	—	—	—	—	4	4	4	,,	—	—	—	—	
Grassington	,,	—	—	60	60	—	—	10	—	—	18	28	88	,,	270	—	—	—	
Gravel	,,	—	—	4	4	—	—	—	—	—	3	3	7	,,	36	15	—	—	
Hebdon Moor	,,	—	—	10	10	—	—	—	—	—	4	4	14	,,	—	—	—	—	
Hardcastle	,,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Old Providence	,,	—	—	2	2	—	—	—	—	—	—	—	2	,,	—	—	—	—	
Pateley Bridge	,,	—	—	40	40	1	—	3	—	—	10	14	54	,,	324	—	—	—	
Raygill	,,	—	—	16	16	6	—	6	—	—	5	17	33	Barytes	2,848	—	—	—	
Ramsgill	,,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Silver Rake	,,	—	—	3	3	—	—	—	—	—	—	—	3	Lead	9	5	—	—	
Skelhorn	,,	—	—	14	14	—	—	—	—	—	1	1	15	,,	5	—	—	—	
Sunside and Merryfield	,,	—	—	6	6	—	—	1	—	—	1	2	8	,,	—	—	—	—	
Winns Level	,,	—	—	4	4	—	—	—	—	—	—	—	4	,,	—	—	—	—	
West Craven Moor	,,	—	—	35	35	—	—	6	—	—	4	10	45	,,	136	—	—	—	

Persons employed in and about the Mines, &c.—*continued.*

Situation of Mines.	Inspector's District.	Underground. Male Persons. Ages 12 to 13.	Ages 13 to 16.	Ages above 16.	Total.	Above ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total underground and above ground.	Kind of Mines.	Mining Produce. Tons.	Cwt.	Qrs.	Lbs.	Remarks.
Wharfedale	F. N. Wardell	—	1	6	7	—	—	—	—	—	—	—	7	Lead	20	1	—	—	
West Pateley Bridge	„	—	—	40	40	—	—	6	—	—	6	12	52	„	42	—	—	—	
Skelhorn	„	—	—	—	—	—	—	—	—	—	—	—	—	Zinc	5	13	—	—	
Allerton	„	—	—	18	18	—	—	—	—	—	23	23	41	Building stone	2,350	—	—	—	
Broad Oak	„	—	—	10	10	—	—	2	—	—	9	11	21	„ „	2,352	—	—	—	
Boggard Lane	„	—	—	6	6	—	—	3	—	—	7	10	16	„ „	1,789	—	—	—	
Brighouse	„	—	—	10	10	—	—	—	—	—	6	6	16	„ „	—	—	—	—	
Broomfield	„	—	—	16	16	—	—	4	—	—	14	18	34	„ „	2,504	—	—	—	
Elland Edge	„	—	—	6	6	1	—	1	—	—	4	6	12	„ „	—	—	—	—	
Hill Top	„	—	—	12	12	—	—	2	—	—	18	20	32	„ „	2,500	—	—	—	
„ Lightcliffe	„	—	—	10	10	—	—	—	—	—	15	15	25	„ „	3,000	—	—	—	
„ „	„	—	—	8	8	—	—	—	—	—	12	12	20	„ „	1,300	—	—	—	
Inch Boyds	„	—	—	13	13	—	—	3	—	—	14	17	30	„ „	2,600	—	—	—	
Idle	„	—	—	80	80	—	—	20	—	—	100	120	200	„ „	6,000	—	—	—	
„	„	—	—	56	56	4	—	14	—	—	71	89	145	„ „	6,000	—	—	—	
Guide Moor	„	—	—	12	12	—	—	—	—	—	9	9	21	„ „	1,000	—	—	—	
Legram Lane	„	—	1	19	20	—	—	1	—	—	14	15	35	„ „	3,200	—	—	—	
Lane Head	„	—	—	40	40	—	—	9	—	—	36	45	85	„ „	7,600	—	—	—	
„	„	—	—	—	—	—	—	—	—	—	—	—	—	Slate	60	—	—	—	
„ Brighouse	„	—	—	9	9	1	—	—	—	—	8	9	18	Building stone	1,000	—	—	—	
„ „	„	—	—	6	6	—	—	—	—	—	8	8	14	„ „	600	—	—	—	
Lillands	„	—	—	6	6	—	—	2	—	—	7	9	15	„ „	2,400	—	—	—	
„ Wood	„	—	—	45	45	2	—	15	—	—	61	78	123	„ „	6,574	—	—	—	
Lane Head	„	—	—	13	13	—	—	3	—	—	16	19	32	„ „	2,542	10	—	—	

Persons employed in and about the Mines, &c.—*continued.*

Situation of Mines.	Inspector's District.	Underground.				Above ground.							Total underground and above ground.	Kind of Mines.	Mining Produce.				Remarks.
		Male Persons.				Ages 8 to 13.		Ages 13 to 18.		Ages above 18.		Total.							
		Ages 12 to 13.	Ages 13 to 16.	Ages above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.				Tons.	Cwt.	Qrs.	Lbs.	
Lightcliffe Road - -	F. N. Wardell -	—	—	8	8	—	—	2	—	—	7	9	17	Building stone -	2,160	—	—	—	
" " - -	" -	—	—	7	7	—	—	1	—	—	6	7	14	" " -	100	—	—	—	
Moore Hey - - -	" -	—	—	2	2	—	—	1	—	—	2	3	5	" " -	300	—	—	—	
Mill Lane - - -	" -	—	—	6	6	—	—	—	—	—	6	6	12	" " -	1,350	—	—	—	
Pond - - - -	" -	—	—	18	18	—	—	4	—	—	17	21	39	" " -	1,800	—	—	—	
Paddock - - -	" -	—	—	8	8	—	—	—	—	—	12	12	20	" " -	1,500	—	—	—	
Pinfold - - -	" -	—	—	6	6	1	—	1	—	—	4	6	12	Slate - -	500	—	—	—	
Quarry House - -	" -	—	—	5	5	—	—	2	—	—	5	7	12	Building stone -	470	—	—	—	
Rake Bank - -	" -	—	—	6	6	—	—	—	—	—	5	5	11	" " -	1,100	—	—	—	
Southedge - - -	" -	—	—	7	7	—	—	—	—	—	6	6	13	" " -	600	—	—	—	
Slaters - - -	" -	—	—	5	5	—	—	—	—	—	6	6	11	" " -	500	—	—	—	
Summerfield - - -	" -	—	—	4	4	—	—	—	—	—	5	5	9	" " -	870	—	—	—	
Spinkwell - - -	" -	—	—	8	8	1	—	—	—	—	9	10	18	" " -	1,800	—	—	—	
Thwaites - - -	" -	—	—	7	7	—	—	2	—	—	8	10	17	" " -	2,424	—	—	—	
Totals - -	- - -	—	2	802	804	17	—	127	—	—	621	765	1,569		74,970	14	—	—	

MINES classed under the METALLIFEROUS MINES REGULATION ACT.

LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in MR. WARDELL'S DISTRICT, comprising YORKSHIRE and LINCOLNSHIRE, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
April 18	1	Broad Oak -	Halifax -	C. and J. Goodyear -	Jos. Jagger -	Stone Miner	21	Fell from ladder in shaft - -	–	–	1	–	–	1
June 24	2	Guyscliffe -	Pateley Bridge	——	Samuel Barker -	Do. -	42	Fall of roof - - -	–	1	–	–	–	1
								Total for the Year - -	–	1	1	–	–	2

LIST OF MINES classed under the METALLIFEROUS MINES REGULATION ACT, in MR. WARDELL'S DISTRICT, 1878.

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Remarks.
Appletreewick Mining Co.	Appletreewick, Gill Head.	Skipton	Lead.
New Appletreewick Mining Co.	Appletreewick	Ditto	Do.
Birkhill Mining Co.	Birkhill, Appletreewick.	Ditto	Do.
Blayshaw Gill Mining Co.	Blayshaw Gill	Pateley Bridge	Do.
Duke of Devonshire	Cononley	Skipton	Do.
Yorkshire Mining Co.	Dry Gill, Appletreewick.	Ditto	Do.
Joseph Mason, Linton	Elbolton	Ditto	Do.
E. Newbould, Greenhow Hill	Foley Gill	Pateley Bridge	Do.
Grimwith Mining Co.	Grimwith	Skipton	Do.
Duke of Devonshire	Grassington	Ditto	Do.
Lodge, Marshall, and Bowdin, Starbottom.	Gravel	Ditto	Do.
Hebdon Moor Mining Co.	Hebdon Moor	Hebdon Moor	Do.
Sunside Lead Mining Co.	Hardcastle	Pateley Bridge	Do.
W. Sykes Ward, Kettlewell	Old Providence	Kettlewell	Do.
E. J. Armstrong	Ramsgill	Pateley Bridge	Do.
P. W. Spencer	Raygill, Lothersdale	Skipton	Sulphate of barytes.
Pateley Bridge Lead Mining and Smelting Co.	Pateley Bridge	Pateley Bridge	Lead.
J. F. Masser, Kettlewell	Silver Rake	Kettlewell	Do.
Baynes and Colville	Skelhorn, Rimmington.	Skipton	Do. and zinc.
Bennally and Hutchinson	Sunside and Merryfield.	Pateley Bridge	Do.
G. Sharpe	West Craven Moor	Ditto	Do.
Wharfedale Mining Co.	Wharfedale	Ditto	Do.
S. Pullan	Winns Level	Appletreewick, Skipton.	Do.
G. H. Strafford	Moonstone	Pateley Bridge.	Stone.
— Wilkinson	Guyscliffe	Ditto	Do.
— Bentley	Ditto	Ditto	Do.
Jas. Dougill	Bishopside	Ditto	Do.
John Dougill	Moonstone	Ditto	Do.
Scotgate Ash Stone Co.	Scotgate Ash	Ditto	Do.
J. Farrar and Sons	Allerton and Thornton.	Bradford.	
D. and C. Roper	Allerton	Ditto.	
C. and J. Goodyear	Broad Oak	Hipperholme.	
Greenwood and Murgatroyd	Boggard Lane	Shipley.	
R. Kershaw	Brighouse	Brighouse.	
Lees and Cliffe	Broomfield	Lightcliffe.	
W. C. Thornhill	Elland Edge	Fixby.	
Abraham Turner	Hill Top	Lightcliffe.	
Gomersal, Bentley, and Butterfield, Hipperholme.	Ditto	Lightcliffe.	
Halifax Building Co.	Inch Royds	Ditto.	
C. Denham & Co.	Idle	Halifax.	
G. Vint and Brothers	Idle Moor	Bradford.	
E. S. Vint	Idle	Ditto.	
R. Roper	Legram Lane	Ditto.	
Greenwood Brothers	Lane Head	Brighouse.	
Rastrick Stone Co.	Lillands	Rastrick.	
D. Moulson	Lane Head	Brighouse.	
J. Roper	Lightcliffe Road	Ditto.	
W. E. Leppington	Lane Head	Ditto.	
C. Sheffield and Son	Lillands	Ditto.	
Huddersfield Quarrying Co.	Longwood House	Huddersfield.	
Illingworth and Midgley	Lightcliffe	Lightcliffe.	
Marshall and Norminton	Lillands Wood	Brighouse.	
N. Shackleton	Moore Hey	Fixby.	
J. Brigg and Son	Mount	Brighouse.	
John Jowett's Executors	Mill Lane	Illingworth.	
Whitaker and Sharp	Paddock	Northowram.	
W. C. Thornhill	Pinfold	Fixby.	
Turner and Brooks	Pond	Lightcliffe.	

List of Mines classed under the Metalliferous Mines Regulation Act—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Remarks.
Halfgate and Jowett	Paddock	Halifax.	
D. Marshall	Pinfold	Fixby.	
A. Marsden	Quarry House	Rastrick.	
W. Hall	Rake Bank	Ovenden.	
G. Rothwell, Southowram	St. Ann's	Halifax.	
W. Thwaite, Southowram	Slaters	Ditto.	
Shepherd and Bentley	Southedge	Hipperholme.	
J. Wood & Co.	Spinkwell	Bradford.	
D. Moulson	Thwaits	Ditto.	
J. M. Beaumont	Elland Edge	Halifax.	
Thos. Aspinall, Elland	Ditto	Ditto.	
J. and A. Robinson	Lane Head	Brighouse.	
S. and J. Cliffe, Brighouse	Ditto	Ditto.	
Allan Wood	Broad Oak	Hipperholme.	
Ledjard Naylor, Lightcliffe	Hill Top	Lightcliffe.	
John Moulson and Sons, Allerton	Guide Moor	Bradford.	
John Jaggar	Rastrick	Rastrick.	
H. Westwood, Lightcliffe	Lightcliffe	Halifax.	

Report of Assistant Inspector.

SIR, Wakefield, 5th February 1879.

I HAVE the honour to report that during last year I exercised the duties of Inspector of Mines in the district comprising Yorkshire and Lincolnshire, and that in so doing I have acted as assistant to and under the directions of Mr. Wardell, the Principal Inspector for that district.

I have, &c.,

The Right Hon. R. A. Cross, M.P., JOHN GERRARD.
Her Majesty's Principal Secretary of State,
Home Department.

Mr. Willis's Report—Coal and Metalliferous Mines.

REPORT on the INSPECTION OF MINES in the NEWCASTLE-ON-TYNE DISTRICT, comprising the North part of the County of DURHAM, the Counties of NORTHUMBERLAND and CUMBERLAND, and the AMOUNDERNESS, or detached part of NORTH LANCASHIRE, for the year ending 31st December 1878.—By JAMES WILLIS, Esq., F.G.S.

SIR, Newcastle-on-Tyne, 31st March 1879.

As Inspector of Mines in charge of the Newcastle-on-Tyne District, I have the honour to lay before you my Report under the Coal and Metalliferous Mines Acts, for the year ending 31st December 1878.

First.—As to the production of minerals from mines and works embraced under one or other of the Acts named.

Coal Mines.—These are situated in Cumberland, North Durham, and Northumberland. Fire-clay, including brick shale, limestone and ganister are worked concomitantly with the coal from some of these mines. The production for the year, and also a comparison of the totals of the preceding year, are as below.

Table I.

1878.	Cumberland.	Durham, North.	Northumberland.	Totals, 1878.	Totals, 1877.
Minerals raised, statute tons—					
Coal	1,393,514	6,265,410	5,254,927	12,913,851	13,316,156
Fire-clay	34,771	121,430	97,491	253,692	326,916
Ironstone of coal measures	—	—	—	—	3,940
Limestone	—	—	3,607	3,607	4,271
Ganister	531	—	—	531	—
Totals, 1878	1,428,816	6,386,840	5,356,025	13,171,681	—
Do. 1877	1,500,453	6,549,506	5,601,324	—	13,651,283

These figures show a diminution of output less in extent than might have been anticipated from the serious depression in all industries affecting the demand for coal which has prevailed during the year.

Metalliferous Mines.—These mines are in a part of Northumberland, Cumberland, and the Amounderness or detached part of North Lancashire. Barytes, copper, lead, and zinc ores, iron ore (principally hematite), whinstone, and umber are the minerals produced. The quantities for the year, compared with those of last year, are as below.

Table II.

1878.	Cumberland.	Lancashire, North.	Northumberland.	Totals, 1878.	Totals, 1877.
Minerals raised, statute tons—					
Barytes	365	—	3,516	3,881	4,448
Copper ore	—	144	—	144	651
Iron ore (hematite)	1,322,028	906,994	—	2,229,022	2,391,398
Lead ore	2,592	—	4,673	7,265	7,890
Umber	—	—	98	98	—
Whinstone	—	—	1,576	1,576	2,272
Zinc ore	1,567	—	—	1,567	1,446
Totals, 1878	1,326,552	907,138	9,863	2,243,553	—
Do. 1877	1,485,423	913,706	8,976	—	2,408,105

Second.—The number of persons employed during the year, and a comparison as regards the totals with the numbers employed in 1877.

COAL MINES.

Table III.

1878.	Cumberland.	Durham, North.	Northumberland.	Totals, 1878.	Totals, 1877.
Underground.					
Boys of 10 and under 12	—	—	—	—	13
Boys of 12 and under 13	18	221	228	467	824
Male young persons of 13 and under 16	353	1,473	1,743	3,569	4,523
Males above 16	3,882	12,550	15,832	32,264	33,084
Total underground, 1878	4,253	14,244	17,803	36,300	—
Do. 1877	4,381	14,315	19,748	—	38,444
Above Ground.					
Boys of 10 and under 13	1	72	28	101	185
Girls „ „	—	—	—	—	—
Male young persons of 13 and under 16	61	486	363	910	1,029
Female „ „ „	7	—	—	7	6
Women above 16	329	—	—	329	302
Males „	1,127	3,234	3,386	7,747	8,053
Total above ground, 1878	1,525	3,792	3,777	9,094	—
Do. 1877	1,440	4,012	4,123	—	9,575
Total number of persons employed in and about the mines, 1878	5,778	18,036	21,580	45,349	—
Do. do. 1877	5,821	18,327	23,871	—	48,019

METALLIFEROUS MINES.

Table IV.

1878.	Cumberland.	Lancashire, North.	Northumberland.	Totals, 1878.	Totals, 1877.
Underground.					
Boys 12 to 13	5	—	—	5	4
Males 13 to 16	117	—	1	118	147
„ above 16	4,380	2,194	268	6,842	7,050
Total underground, 1878	4,502	2,194	269	6,965	—
Do. 1877	4,826	2,061	314	—	7,201
Above Ground.					
Males 8 to 13	13	10	6	29	48
Females „	—	—	—	—	—
Males 13 to 18	280	161	79	520	531
Females „	7	—	—	7	—
Females above 18	—	—	—	—	—
Males „	1,167	950	116	2,233	2,357
Total above ground, 1878	1,467	1,121	201	2,789	—
Do. 1877	1,551	1,162	223	—	2,936
Total number of persons employed in and about the mines, 1878	5,969	3,315	470	9,754	—
Do. do. 1877	6,377	3,223	537	—	10,137

Third.—The number of fatal accidents of different kinds, with the number of lives lost, which have occurred during the year; also, continuing my former practice, the number for five years previously, and also the averages of the five preceding years.

COAL MINES.

Table V.

	Number of separate Accidents.							Number of Deaths resulting.						
	Years and Averages.							Years and Averages.						
	1873.	1874.	1875.	1876.	1877.	Average of 5 years.	1878.	1873.	1874.	1875.	1876.	1877.	Average of 5 years.	1878.
Underground.														
Explosions of fire-damp	—	—	3	2	1	1·2	1	—	—	4	3	1	1·6	1
Falls in Mine.														
Falls of side	5	9	2	6	4	5·2	4	6	9	2	6	4	5·4	4
Falls of roof	41	18	22	28	27	27·2	27	42	18	22	29	28	27·8	28
Total falls	46	27	24	34	31	32·4	31	48	27	24	35	32	33·2	32
In Shafts.														
Overwinding	1	—	—	—	—	·2	—	2	—	—	—	—	·4	—
Ropes or chains breaking	—	1	—	—	—	·2	1	—	1	—	—	—	·2	2
Whilst ascending or descending	2	2	—	—	—	·8	—	2	2	—	—	—	·8	—
Falling into shaft from top	2	2	1	—	—	1·0	1	2	2	1	—	—	1·0	1
Things falling from top of shaft	1	1	—	—	—	·4	—	1	1	—	—	—	·4	—
Falling from part way down	4	1	2	2	3	2·4	—	4	1	2	2	3	2·4	—
Things falling from part way down	—	—	1	1	—	·4	—	—	—	1	1	—	·4	—
Sundries in shafts	1	2	1	2	—	1·2	1	1	2	1	2	—	1·2	1
Totals in shafts	11	9	5	5	3	6·6	3	12	9	5	5	3	6·8	4
Miscellaneous Underground.														
Explosions of gunpowder	5	5	3	1	1	3·0	1	5	5	3	1	1	3·0	1
Suffocation by gases	1	2	1	—	1	1·0	—	1	2	1	—	2	1·2	—
Irruptions of water	—	1	—	—	—	·2	—	—	1	—	—	—	·2	—
Falling into water	—	—	—	—	—	—	—	—	—	—	—	—	—	—
On incline and engine planes	4	8	7	2	—	4·2	1	4	8	7	2	—	4·2	1
By trams or tubs	11	9	12	14	12	11·6	6	11	9	12	14	12	11·6	6
By machinery	1	—	—	—	—	·2	—	1	—	—	—	—	·2	—
Sundries	1	2	6	1	1	2·2	—	1	3	6	1	1	2·4	—
Total miscellaneous underground	23	27	29	18	15	22·4	8	23	28	29	18	16	22·8	8
Totals underground	80	63	61	59	50	62·6	43	83	64	62	61	52	64·4	45
On Surface.														
By machinery	1	1	2	1	2	1·4	—	1	1	2	1	2	1·4	—
By boilers bursting	3	—	—	1	—	·8	—	3	—	—	2	—	1·0	—
By sundries	8	3	9	6	12	7·6	6	8	3	9	6	12	7·6	6
Totals on surface	12	4	11	8	14	9·8	6	12	4	11	9	14	10·0	6
Totals in and about the mines	92	67	72	67	64	72·4	49	95	68	73	70	66	74·4	51

METALLIFEROUS MINES.

The following table only shows the comparison of fatal accidents since 1875, that being the first year in which the metalliferous portion of the district was placed under my charge.

Table VI.

	Number of separate Accidents.				Number of Deaths resulting.			
	Years.				Years.			
	1875.	1876.	1877.	1878.	1875.	1876.	1877.	1878.
Underground.								
Explosions of firedamp	—	—	—	—	—	—	—	—
Falls in mines	8	7	10	7	8	7	10	7
In Shafts.								
Overwinding	—	1	—	—	—	1	—	—
Ropes and chains breaking	1	—	—	—	2	—	—	—
Whilst ascending or descending	—	—	—	4	—	—	—	4
Falling into shaft from surface	—	—	—	3	—	—	—	3
Things falling from surface	—	—	1	—	—	—	1	—
Falling from part way down	2	3	2	2	2	3	3	2
Things falling from part way down	1	1	—	—	1	1	—	—
Miscellaneous in shafts	3	2	—	1	3	2	—	1
Totals in shafts	7	7	3	10	8	7	4	10
Miscellaneous Underground.								
Explosions of gunpowder, &c.	2	2	2	3	2	2	2	3
Suffocation by gases	1	—	—	—	1	—	—	—
Irruptions of water	—	—	—	—	—	—	—	—
Falling into water	—	—	1	—	—	—	1	—
On inclined planes	—	—	—	—	—	—	—	—
By trams and tubs	—	—	—	—	—	—	—	—
By machinery	—	—	—	—	—	—	—	—
Sundries	—	1	1	1	—	1	1	1
Total miscellaneous underground	3	3	4	4	3	3	5	4
Total underground	18	17	17	21	19	19	19	21
On Surface.								
By machinery	—	—	—	—	—	—	—	—
By boilers bursting	—	—	—	—	—	—	—	—
By sundries	—	—	2	1	—	—	2	1
Totals on surface	—	—	2	1	—	—	2	1
Totals in and about the mines	18	17	19	22	19	19	21	22

The results shown by Table V., the number of separate fatal accidents and the number of deaths resulting therefrom in the coal mines of the district, are very satisfactory, the total number of accidents and deaths underground being 43 and 45 respectively, as against an average of the preceding five years of 62·6 and 64·4 respectively, or, in other words, a diminution of 19 accidents and deaths. A similar reduction is also seen in the accidents and deaths on the surface, being 6 accidents and 6 deaths, against the average of 9·8 and 10 respectively. The difference in the gross of accidents and deaths in and about the mines appearing thus: the average number of accidents for five years being 72·4, and the number for the year under notice, 49; the average number of deaths resulting in five years, 74·4, and the number for 1878, 51, or a decrease of 32 per cent. and 31·5 per cent. respectively. Viewing the subject thus, it would be well to bear in mind that the production of minerals over the period embraced in the consideration has been almost stationary, and that the number of lives lost in mining operations will always bear a somewhat relative proportion to the number of tons of minerals worked.

Proportions of Deaths in the various Classes of Accidents.

Of the various classes of accidents shown in Table V. the proportions of lives lost (it is unnecessary further to distinguish between the number of accidents and the deaths caused thereby) under each division stand thus:—

Explosions of fire-damp	1	= 1·96	per cent.
Falls in mine	32	= 62·75	„
In shafts	4	= 7·85	„
Miscellaneous underground	8	= 15·68	„
On surface	6	= 11·76	„
	51	= 100·00	„

and these proportions compare with the average of the preceding five years thus:—

Explosions of fire-damp	1·6	= 2·15	per cent.
Falls in mine	33·2	= 44·62	„
In shafts	6·8	= 9·14	„
Miscellaneous underground	22·8	= 30·65	„
On surface	10·0	= 13·44	„
	74·4	= 100·00	„

These proportions are instructive as showing that the manifest improvement in the death rate of the district is to be found in the divisions where skilled management can best be shown. The per-centage of the accidents arising from "falls in the mine," it will be seen, is in a worse position materially in 1878, although the total loss of life is so much smaller than in the average of the five years preceding. Of course it is well understood that freedom from accidents by "falls" is very much more dependent upon the exercise of care and discretion upon the part of the workmen themselves than is the case with any other class of accidents. Here, however, vigilance, care, and a stern insistance of rigid discipline on the part of officials and managers cannot fail to beget the exercise of the same salutary principles on the part of the workmen.

Proportions of Deaths under and above 16 *years of age.*

Gathering a suggestion from your circular letter to me of 1st February 1879, in which it is stated, "attention has been called to the large number of separate accidents which have "occurred in the collieries of certain districts, especially among *boys* and youths who are "sometimes killed and sometimes terribly mutilated, mainly due to slips of roof and coal, "and to runaway trams underground," I have calculated that the proportion of boys employed under, say, 16 years of age in and about the mines is 11 per cent. of the work-persons employed, and of the 51 deaths recorded for the year 6 were young persons under 16, or nearly 12 per cent. of the whole, and possibly therefore the deaths of young persons would not appear to be in undue proportion.

Deaths, not included in Lists or Tables.

I have received during the year notices of death which I have not considered as being within the Act, and have therefore omitted them; most of them were cases of sudden death from heart disease, and fits of various kinds.

Notices of Non-fatal Accidents.

The numbers of non-fatal accidents received during the year, and the number of persons injured thereby, have been as follows, ranging the numbers under the various "heads" by which they are embraced, omitting those heads under which no accidents have been reported:

	Accidents.	Persons injured.
Explosions of fire-damp	8	13
Falls in mine:		
Falls of side	27	27
Falls of roof	63	64
Total falls in mines	90	91

	Accidents.	Persons injured.
In shafts:		
Whilst ascending or descending by machinery	1	1
Things falling from surface - -	2	2
Things falling from part way down -	1	1
Miscellaneous in shafts - - -	1	1
Total in shafts -	5	5
Miscellaneous underground:		
Explosions of gunpowder, &c. - -	14	16
On inclined planes - -	5	5
By trams and tubs - - -	32	32
By machinery underground - -	1	1
Sundries underground - -	11	11
Total miscellaneous underground -	63	65
Total underground -	166	174
On surface:		
By machinery - - - -	3	3
Miscellaneous - - - -	8	9
Total on surface -	11	12
Total in and about the mines -	177	186

The accidents causing the "personal injuries" are, as will be seen, similar in nature to those from which the loss of life arises. They are exceedingly numerous and represent a vast amount of personal suffering, and, it is to be feared, in many cases family distress. The notices sent to me under the Act do not give the whole of the cases, because when the accident occurs it may be considered of such a slight nature that it does not come under the terms of the Act. I have endeavoured this year to ascertain, as far as possible, how long each person injured has been laid off work, in order to make this part of my report as useful as may be, and in doing so I have obtained information concerning 194 persons who have been injured, being eight more than I have received notices for. The result of my inquiry is this: —

1 person died of consumption soon after injury.
1, arm amputated, and will not return.
2 injured so that it is improbable they will recover.
7 have left the collieries, supposed to be recovered.
2 off work 2 weeks, and still absent at date of inquiry.

3	„	4	do.	do.
1	„	5	do.	do.
1	„	7	do.	do.
1	„	8	do.	do.
2	„	9	do.	do.
1	„	10	do.	do.
3	„	11	do.	do.
1	„	12	do.	do.
3	„	13	do.	do.
1	„	16	do.	do.
4	„	17	do.	do.
3	„	18	do.	do.
1	„	20	do.	do.
3	„	24	do.	do.
1	„	25	do.	do.
2	„	27	do.	do.
1	„	29	do.	do.
1	„	31	do.	do.
1	„	38	do.	do.
1	„	40	do.	do.
2	„	41	do.	do.
1	„	44	do.	do.
1	„	51	do.	do.

Of those who had recovered and were following their occupation at the time of my inquiry,

9	were off work	1 week.	2	were off work	17 weeks.
19	„	2 weeks.	1	„	18 „
12	„	3 „	1	„	19 „
19	„	4 „	2	„	20 „
11	„	5 „	2	„	21 „
13	„	6 „	1	„	22 „
12	„	7 „	1	„	24 „
9	„	8 „	1	„	27 „
2	„	9 „	1	„	28 „
4	„	10 „	1	„	30 „
1	„	11 „	1	„	31 „
3	„	12 „	2	„	32 „
3	„	14 „	1	„	34 „
2	„	15 „	1	„	39 „
4	„	16 „	1	„	45 „

A more familiar view of these figures may be obtained by stating that they are equal to a detention from work of 40 persons for 12 months.

Explosions of Gas (Non-fatal) Dates.

The non-fatal explosions of gas occurred on the following dates, viz., 10th February, 25th March, 18th April, 30th April, 17th June, 22nd July, 7th August, and 9th August. These were all very carefully investigated at the time, and do not require any detailed remarks. Every one of them arose in consequence of more or less carelessness.

The number of deaths shown in Table VI. (metalliferous mines) is very similar to the number for last year. There is, however, a pleasing diminution in the number under "falls of ground," although this decrease is more than made up for in the shaft accidents.

The death rate by this class of accident is very much higher than in the coal mines of the district, and requires the very serious attention of managers and all concerned in the safe working of the mines.

It is unnecessary to speak further of this Table at present, any remarks being reserved for my description of the more notable accidents following the usual "List of Accidents."

Non-fatal reported Accidents.

The reported non-fatal accidents during the year in metalliferous mines have been 31 causing injury to 35 persons, and have been caused thus:—

	Accidents.	Persons injured.
Falls of ground - - -	14	15
Explosions of gunpowder, &c. - -	12	15
By trams and tubs - - -	3	3
On surface - - -	2	2
	31	35

List of Fatal Accidents in the Coal Mines.

The following is a list in the usual form of the fatal accidents which have occurred during the year in the mines under the Coal Mines Regulation Act:—

MINES CLASSED UNDER THE COAL MINES REGULATION ACT.

LIST of the FATAL ACCIDENTS, and LOSS of LIFE arising therefrom, in Mr. WILLIS'S DISTRICT, consisting of the COUNTIES of CUMBERLAND and NORTHUMBERLAND, and the NORTHERN PORTION of the COUNTY of DURHAM, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Jan. 12	1	Wearmouth	Sunderland	Wearmouth Coal Co.	Thomas Watt	Hewer	57	Crushed by tubs on engine plane	–	–	–	1	–	1
„ 17	2	Stella	Blaydon	Stella Coal Co.	Robert Gallon	Tub mender	70	Fell on flat sheets and broke his thigh	–	–	–	–	1	1
„ 24	3	West Wylam	Prudhoe	Mickley Coal Co.	Henry Herron	Trapper	12	Crushed by coal and stone	–	1	–	–	–	1
Feb. 7	4	Whitehaven	Whitehaven	Earl of Lonsdale	William Tate	Hewer	45	Fall of top coal	–	1	–	–	–	1
„ 10	5	Pontop	Annfield Plain	John Bowes and Partners.	William Thompson	Deputy	33	Explosion of fire-damp	1	–	–	–	–	1
„ 15	6	Prudhoe	Prudhoe	Mickley Coal Co.	George Whitfield	Shifter	58	Fall of stone	–	1	–	–	–	1
„ 19	7	Team	Gateshead	A. E. Burdon	John McCarren	Furnaceman	60	Crushed by cage	–	–	1	–	–	1
Mar. 12	8	Pontop	Annfield Plain	John Bowes and Partners.	William Standridge	Putter	15	Fall of stone	–	1	–	–	–	1
„ 13	9	Clifton	Workington	West Cumberland Iron and Steel Co.	Thomas Owens	Hewer	19	Ditto	–	1	–	–	–	1
„ 25	10	Washington	Gateshead	Washington Coal Co.	John Hepplewhite	Shifter	63	Ditto	–	1	–	–	–	1
„ 27	11	Lintz	Ditto	F. McClean	Joseph Lyman	Chockman	41	Ditto	–	1	–	–	–	1
Apr. 29	12	Delaval Benwell	Newcastle-on-Tyne.	J. O. Scott	Joseph Irvine	Putter	18	Fall of sagre clay	–	1	–	–	–	1
„ 30	13	North Wylam	Wylam	R. Dunn	James Doby	Banksman	47	Crushed by coal truck	–	–	–	–	1	1
May 7	14	Seaton Delaval	Newcastle-on-Tyne.	A. E. Burdon and Partners.	John Smith	Stower	30	Fall of stone	–	1	–	–	–	1
„ 10	15	Washington	Gateshead	Washington Coal Co.	Edward Hall	Hewer	42	Ditto	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.					
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
May 17	16	Choppington -	Morpeth -	N. G. Lambert and Co.	James White -	Driver -	17	Crushed by tub - - -	–	–	–	1	–	1
„ 17	17	Dinnington -	Newcastle-on-Tyne.	John Bowes and Partners.	George Naisbit -	Hewer -	40	Fall of stone - - - -	–	1	–	–	–	1
„ 23	18	Wearmouth -	Sunderland -	Wearmouth Coal Co.	William Rowland -	Ditto -	48	Ditto - - - -	–	1	–	–	–	1
June 3	19	Ditto -	Ditto -	Ditto - -	Thomas Grieves -	Shifter -	42	Ditto - - - -	–	1	–	–	–	1
„ 6	20	Felling - -	Gateshead -	Sir G. Elliot, Bart. -	Thomas Lilburn -	Hewer -	29	Ditto - - - -	–	1	–	–	–	1
„ 13	21	Hilda - -	South Shields -	Harton Coal Co. -	John Smith -	Station lad	16	Crushed between tub and prop - -	–	–	–	1	–	1
„ 26	22	Hebburn - -	Hebburn - -	Tyne Coal Co. -	William Rigby -	Timber lad	18	Fall of stone - - - -	–	1	–	–	–	1
July 3	23	Whitehaven -	Whitehaven -	Earl of Lonsdale -	Thomas Corlett -	Drifter -	40	Explosion of a shot while drawing pricker	–	–	–	1	–	1
„ 10	24	Seaton Delaval -	Newcastle-on-Tyne.	A. E. Burdon and Partners.	John Long - -	Hewer -	54	Crushed by tubs on inclined plane -	–	–	–	1	–	1
„ 13	25	Washington -	Gateshead -	Washington Coal Co.	Robert Smith -	Deputy -	59	Fall of stone - - - -	–	1	–	–	–	1
„ 25	26	Prudhoe -	Prudhoe - -	Mickley Coal Co. -	J. T. Armstrong -	Truck shunter	42	Crushed between truck and screens -	–	–	–	–	1	1
Aug. 1	27	Heworth - -	Gateshead -	Henderson, Anderson, and Co.	T. A. Lee - -	Shifter -	68	Fall of stone - - - -	–	1	–	–	–	1
„ 8	28	West Pelton -	Chester le Street	James Joicey and Co.	Robert Bowden -	Hewer -	57	Ditto - - - -	–	1	–	–	–	1
„ 12	29	Stella - -	Blaydon - -	Stella Coal Co. -	John Lee -	Cartman -	21	Run over by waggons - - -	–	–	–	–	1	1
„ 19	30	Tanfield Moor -	Annfield Plain -	James Joicey and Co.	George Brown -	Chock drawer	25	Fall of stone - - - -	–	1	–	–	–	1
„ 26	31	Wearmouth -	Sunderland -	Wearmouth Coal Co.	Lawrence McKenna	Driver -	14	Ditto - - - -	–	1	–	–	–	1
Sept. 3	32	Allhallows -	Aspatria - -	Messrs. Fletcher & Co.	Isaac Davidson -	Hewer -	29	Ditto - - -	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives Lost.					
									Explosions of Firedamp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground	Total.
1878.														
Sept. 5	33	Beamish - -	Chester le Street	James Joicey and Co.	John Haisley -	Chock drawer	28	Fall of stone - - - -	–	1	–	–	–	1
„ 10	34	Crosby and Gilcrux.	Maryport -	W. Mulcaster and Co.	Joseph Duggan -	Hewer -	27	Ditto - - - -	–	1	–	–	–	1
„ 12	35	South Benwell -	Newcastle-on-Tyne.	W. Cochrane Carr	Joseph Douglass -	Sinker -	35	Cradle rope broke and deceased fell down shaft - - - -	–	–	1	–	–	2
					George Charlton -	Ditto -	56		–	–	1			
„ 20	36	Bedlington -	Morpeth - -	Bedlington Coal Co.	Leeman Craigs -	Deputy -	31	Fall of stone - - - -	–	1	–	–	–	2
					Thomas Cullen -	Ditto -	28		–	1				
„ 25	37	Seaton Burn -	Newcastle-on-Tyne.	John Bowes and Partners.	Joseph Reed -	Ditto -	55	Ditto - - -	–	1	–	–	–	1
Oct 4	38	South Benwell -	Ditto -	W. Cochrane Carr -	William Simpson -	Hewer -	48	Fall of sagre clay - - -	–	1	–	–	–	1
„ 5	39	Usworth -	Gateshead -	Sir G. Elliot and Co.	Frank Barr - -	Ditto -	56	Fall of stone - - - -	–	1	–	–	–	1
„ 11	40	Wearmouth -	Sunderland -	Wearmouth Coal Co.	Thomas Clarke -	Putter -	23	Crushed by tubs - - -	–	–	–	1	–	1
„ 15	41	Washington -	Gateshead -	Washington Coal Co.	Patrick Quinn -	Coupler -	13	Ditto - - - -	–	–	–	1	–	1
„ 16	42	Broomhill -	Acklington -	J. Sowerby and H. Andrews.	Thomas Gass -	Locomotive engine-driver.	46	Crushed between locomotive and waggon	–	–	–	–	1	1
„ 30	43	Byermoor -	Gateshead -	John Bowes and Partners.	Edward Harrison -	Hewer -	49	Fall of coal - - - -	–	1	–	–	–	1
Sept. 2	44	Saint Helen's -	Maryport - -	W. Mulcaster and Co.	Thomas Kent -	Ditto -	36	Fall of stone - - - -	–	1	–	–	–	1
„ 9	45	Acomb - -	Hexham - -	M. Morrison - -	Edward Callaghan	Driver -	14	Crushed by tubs - - - -	–	–	–	1	–	1
„ 16	46	Allhallows -	Aspatria - -	Messrs. Fletcher & Co.	Joseph Buchannan	Hewer -	18	Fall of stone - - - -	–	1	–	–	–	1
„ 21	47	Throckley -	Newcastle-on-Tyne.	Throckley Coal Co. -	William Allister -	Tub cleaner	14	Fell off a gangway - - -	–	–	–	–	1	1
Dec. 9	48	Cowpen -	Blyth - -	Cowpen and North Seaton Coal Co.	Robert Allan -	Hewer -	50	Fall of stone - - - -	–	1	–	–	–	1
„ 20	49	Otterburn - -	Otterburn -	James Chisholm -	Michael Hamilton -	Ditto -	53	Fell down shaft - - - -	–	–	1	–	–	1
								Total for 1878 - - -	1	32	4	8	6	51

The following remarks apply to such of the fatal accidents in and about the coal mines as appear to require a more detailed description than will be found in the list.

Explosion of Gas.

No. 5 in the list.—This accident arose from the deputy in charge of the district going into a place, for the purpose of examining it, with a naked light, instead of with a locked safety lamp as prescribed by the special rules of the colliery. It is of rare occurrence that gas is produced in the seams in the neighbourhood of this colliery, and hence a little carelessness is liable to arise, which was so in this case.

Falls of Roof and Sides.

Each of the accidents under this head, with one exception, has been the cause of one death, the accident No. 36 in the list having caused two deaths. I will describe a few of them as briefly as I can.

No. 12.—Deceased was a putter, and had asked permission of the overman, on the morning of the accident, to "hew" a few coals, so as to add a little to his earnings. The overman refused permission. A hewer gave evidence that deceased came to his place, in the course of his duty, to take away a tub of coals. The tub not being quite ready, deceased left the place and went into another, where, shortly afterwards, he was found with a "side waver" or fall of sagger from the "face" on his head. This hewer had not heard him hewing, nor did he think the place appeared as if deceased had been doing so. The place was well timbered, but had not been at work for some time.

As there was a pick beside deceased when he was found, I think it very likely he had, notwithstanding the overman's orders, been commencing to hew.

No. 18.—Deceased was filling a tub of stone which had been taken down during the former shift. The place had been examined by the previous workers, and also by a deputy two or three hours before the accident. Deceased had been seen also to examine the roadway himself. Whilst filling the tub a movement of the place began, giving some warning, but not in sufficient time to permit deceased to escape, although a man working beside him got clear.

No. 19.—Deceased and others were taking up bottom in a broken jud. Deceased had himself set some timber shortly before the accident, and the place had been carefully examined, both by those in charge and some of the men who had the work to do. No danger was apprehended. One witness said he heard the place moving and said they should go out, and in endeavouring to do so deceased was caught by the falling stones.

No. 20.—Two men were hewing in a broken place. Before commencing work they both tried the roof (the place having also been previously examined by the deputy), and thought it safe. They worked for some time, and again tried the roof, and thought it sounded "heavy;" they then went for some timber, which was close at hand, which they brought, but before setting, and for convenience in doing so, deceased was shovelling some coals into a tub, when the stone fell upon him. His partner escaped with slight bruises.

I do not think it would be useful to extend the number of these descriptions, but I may observe that in no case has it been found that any neglect of careful examinations on the part of the deputies and others having charge of the work could be traced, and many of the accidents have occurred to workmen of great experience, who have always been in the habit of examining their places themselves. This was notably so in the case of No. 36 accident. The two men in this instance were experienced and superior deputies. They were drawing the timber from a "jud," a description of work in the pit where the accident took place, always performed by deputies. The place had been carefully examined by them, and there did not appear to be any need for hurry or excitement in the work. Safety props, so necessary in work of this kind, had been, to all appearances, judiciously set, and yet the whole mass of roof came away unexpectedly, and without warning. The hewer to whom the place belonged was sitting beside the men when they were doing the work, and gave valuable and pleasing testimony of the care with which they had gone about it.

In Shafts.

Accident No. 7.—Deceased, who was an old man, had been lowered to the shaft bottom in the cage, and had signalled to the engineman notifying this. After waiting some time the engineman began to draw the cage, which the signal already given would permit him to do, but in moving his engine it stood on the "centre." Some men working near the bottom of the shaft heard deceased shouting, and went and found his arm fastened between cage

and conductor, and much injured. It could not be ascertained why he had again entered the cage after signalling to the surface.

No. 35.—Deceased men were doing some work in the shaft and were lowered down on a cradle. On reaching the place of work, and having rested some time, the rope by which the cradle was hung broke, and they fell to the bottom. The rope had been in use for the same purpose for several days previously, and had frequently maintained as much as four times the weight on it at the time of breaking. It was ascertained that the rope had been stored away for upwards of a year in what was considered a suitable place. Hempen ropes out of use and stored away, however carefully, are liable to deteriorate, as was no doubt the case here, and their use should never be resumed until they have been tested up to at least the theoretical *working* strain. The weight on this rope at the moment of breakage was not one fifth the theoretical working load.

No. 49.—The colliery where this occurred is a very small landsale in the remote parts of Northumberland. The mode of descending the shaft is by the very primitive mode of forming a "loop" at the end of the drawing rope, into which the person descending inserts one leg. The very severe frost had so stiffened the rope that it became inconvenient to do this, and deceased had procured a piece of old rope or cord about the thickness of an ordinary clothes line, and had formed a three-ply loop. It is supposed that in the darkness he had only got one ply of this loop over the hook attached to the drawing rope, and that the single ply was not strong enough to maintain his weight, and so broke and caused him to fall to the bottom. When the loop was found beside his body, *one* ply was broken in two. The owner of the colliery had warned deceased not to use this loop, and a small chain had been provided by him for the purpose.

Miscellaneous Underground.

The only accident I think it necessary to make comment upon is No. 23 in the list This was caused by the premature explosion of a shot whilst drawing the "pricker." The shot had been prepared in the ordinary manner, and to facilitate the withdrawal of the pricker, which, in accordance with the Act, was not of iron or steel, but of copper, deceased had put the beater through the eye of the pricker, and struck it three or four times with a hammer, when the shot exploded. The case was very carefully investigated, and was the subject of a "question" in the House of Commons. Accidents of this nature, though fortunately for the most part non-fatal, are very numerous. Whilst the law prohibits certain of the tools used being made of iron or steel, it should not be inferred from this that tools of other metals are positively safe. I fear this notion is somewhat prevalent, and possibly less care is exercised than was the case when no such prohibition existed.

With your approval I issued a circular to the owners, agents, and managers of collieries and mines soon after this accident happened, and I am glad to say I have not since that time had notice of accident under similar circumstances.

The following is a copy of the circular :—

"Dear Sirs, Newcastle-on-Tyne, August 1878.

"Accidents having occurred in this district by premature explosions of shots at the moment of using the tools generally employed in their preparation, I am instructed by the Secretary of State to point out to you that although general rule 8 (Coal Mines Regulation Act, 1872) prohibits the use of or possession of underground tools made of iron or steel, it should not be considered that tools made of other metals, such as copper, brass, or bronze, are absolutely safe.

"You should therefore take every opportunity of cautioning your officials and workmen that very great care should be exercised in the preparation of shots, even when the tools are of other metals than iron or steel. Also that care should be used in the selection of materials for the stemming or tamping, and that on no account should a hammer be used either in stemming or in withdrawing the pricker, the application of sudden and great force, such as that of a hammer, applied to the tools when in contact with the shot or cartridge being exceedingly dangerous.

"I am, yours faithfully,

"To the Owners, Agent, and Manager. JAMES WILLIS."

The following is a list of the fatal accidents in the metalliferous mines :—

METALLIFEROUS MINES ACTS.

LIST of the FATAL ACCIDENTS, and LOSS of LIFE arising therefrom, in MR. WILLIS'S DISTRICT, consisting of the COUNTIES of CUMBERLAND and NORTHUMBERLAND, and the AMOUNDERNESS or detached part of NORTH LANCASHIRE, during the Year 1878.

Date.	No. of Accidents.	Name of Mine.	Where situate.	Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Firedamp.	Falls of Ground.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Jan. 2	1	Ehen - -	Egremont -	Ehen Mining Co. -	David McClenegan	Hooker-on	27	Supposed to have been caught by ca e and carried up shaft; he fell when some distance up.	–	–	1	–	–	1
Feb. 11	2	Stonecroft and Greyside.	Hexham -	Stonecroft and Greyside Mining Co.	John Jordan -	Miner -	41	Cage went amain in shaft - -	–	–	1	–	–	1
„ 21	3	Ehen - -	Egremont -	Ehen Mining Co. -	Patrick Milligan -	Ditto -	33	Fall of ore - - - -	–	1	–	–	–	1
Mar. 9	4	Salter Hall -	Frizington -	J. Dixon and Co. -	John Brown -	Ditto -	36	Fall from roof - - - -	–	1	–	–	–	1
May 14	5	Parkhouse -	Dalton-in-Furness	Yarlside Mining Co.	Thomas Pierce -	Ditto -	20	Explosion of dynamite - - -	–	–	–	1	–	1
„ 31	6	Montreal -	Whitehaven -	John Stirling - -	Joseph Kyles -	Ditto	21	Crushed by cage - - -	–	–	1	–	–	1
June 5	7	Eskdale - -	Eskdale -	Whitehaven Iron Mines Co.	T. J. Hoskings -	Ditto -	20	Fall of side - - - -	–	1	–	–	–	1
„ 20	8	Eskett - -	Whitehaven -	Eskett Iron Ore Co. -	John Kermode -	Ditto -	28	Fall of roof - - - -	–	1	–	–	–	1
July 3	9	Parkhouse -	Dalton-in-Furness	Yarlside Mining Co. -	Edward Hooper -	Ditto -	25	Explosion of dynamite - -	–	–	–	1	–	1
Aug. 5	10	Moor Row -	Whitehaven -	Moor Row Mining Co.	Mark Daniels -	Ditto -	29	Ditto - - -	–	–	–	1	–	1
„ 16	11	Park - -	Dalton-in-Furness	Barrow Hematite Steel Co.	Richard Johnson -	Shaftsman -	40	A stage in shaft gave way, and he fell down shaft.	–	–	1	–	–	1
„ 20	12	Cleator - -	Cleator - -	Cleator Iron Ore Co. -	Charles Rooney -	Miner -	56	Fall of ore - - -	–	1	–	–	–	1
Oct. 1	13	Roanhead -	Dalton-in-Furness	Kennedy, Brothers -	James Pope -	Ditto -	46	Fell down a rise - - -	–	–	1	–	–	1
„ 2	14	Stonecroft and Greyside.	Hexham - -	Stonecroft and Greyside Mining Co.	Robert Herdman -	Labourer -	48	Fell down shaft - - -	–	–	1	–	–	1
„ 4	15	Lindal Moor -	Ulverston -	Harrison, Ainslie, and Co.	John Butcher -	Ore picker -	55	Crushed by a waggon - -	–	–	–	–	1	1
„ 15	16	Cleator - -	Cleator - -	Cleator Iron Ore Co. -	Andrew Ireland -	Manager -	59	Fell down shaft - - - -	–	–	1	–	–	1
Nov. 26	17	Mowbray -	Whitehaven -	Mowbray Iron Ore Co.	John Cowan -	Miner -	41	Fell from kibble in sinking pit - -	–	–	1	–	–	1
Dec. 5	18	Montreal -	Ditto -	John Stirling -	James Fagan -	Ditto -	26	Fall of ore - - - -	–	1	–	–	–	1
„ 11	19	Big Rigg -	Cleator - -	S. and J. Lindow -	Joseph Haigh -	Ditto -	32	Fall of stone - - -	–	1	–	–	–	1
„ 12	20	Roanhead -	Dalton-in-Furness	Kennedy, Brothers -	John Miller -	Ditto -	53	Crushed by cage - - -	–	–	1	–	–	1
„ 19	21	Lindal Moor -	Ulverston -	Harrison, Ainslie, and Co.	William Porter -	Ditto -	36	Fall of loose ore from a bench - -	–	–	–	1	–	1
„ 26	22	Goosegreen -	Frizington -	James Bain and Co.	John Tyson - -	Ditto -	19	Fell down shaft - - -	–	–	1	–	–	1
								Total for 1878 -	–	7	10	4	1	22

FALLS OF GROUND.

These accidents are very similar in character to those arising from the same causes in the coal mines. The prevention of them is very much in the hands of the workmen themselves.

IN SHAFTS.

No. 2.—This arose from a want of care on the part of the engineman and from a laxity of discipline about the mine. It was a rule that men were not permitted to ascend or descend in the cages, suitable climbing ladders being in use for this purpose. This rule was frequently neglected, and, I am afraid, with the knowledge of the under-managers.

The drum of the engine was one which could be detached at pleasure, and, previous to deceased and another being ready to descend, had been put out of gear for the purpose of running the engine to fill the boiler. When the men were ready to descend, the engineman permitted them to enter the cage, and attempted to lower them without putting the drum into gear, as, he deposed, he had sometimes done previously. The break on the drum was not in a condition such as it should have been; the break lever, when force was applied, was resting on the lever guard, and hence, whatever power the engineman applied, was useless. Thus, the descending cage ran amain to the bottom, and one of the men was so injured that he died.

No. 6.—Deceased was assisting to clean out the sump at the pit bottom, and in, apparently, attempting to get on to the cage after an ascent signal had been given, he was caught between the cage and the top of the ingoing.

No. 14.—This took place at a midworking. Deceased had sent away a cage containing "deads" or rubbish, and wished to give some instructions to some men at the bottom of the shaft, and for this purpose looked over in the place of the descending cage, which struck him and knocked him into the shaft, down which he fell. He was, a moment before, speaking to a lad on religious topics and had evidently forgotten himself altogether. On my investigating this case, I found the opening into the shaft was entirely unfenced. *See* General Remarks.

No. 16.—Deceased was the manager of the mine, and was giving directions to workmen about opening out an old shaft. He stepped on the covering, which, being of wood and having been there for several years, had become rotten, and being unable to sustain his weight, broke away, and he fell to the bottom.

All coverings to abandoned shafts should be of good brick or stone masonry, dome-shaped or an arch, with good hold of the undisturbed strata, or, which is better still, if the shaft is not likely to be of further use, it should be filled up.

MISCELLANEOUS UNDERGROUND.

Nos. 5 and 9.—These two accidents, by explosion of dynamite, in addition to my own investigations, were attended to by Major A. Ford, R.A., Her Majesty's Inspector of Explosives, who also attended the inquest held on the bodies of the men. Major Ford reported the result of his inquiry to you on the 27th July last very exhaustively, to which report I beg very respectfully to refer. I beg to say that I concur in the conclusions arrived at by Major Ford in his report.

No. 10.—Also from an explosion of dynamite. It was proved with tolerable clearness that in this case deceased had been tamping the charge, after inserting it in the hole, with an iron bar.

It was a violation of general rule 2, sub-rule (*d.*), that an iron bar should be used for such a purpose, or that such a bar should be underground at all; but it is in the power of the Secretary of State to grant exceptions from the operation of this section (23) of the Metalliferous Act, although no such exception had been granted to this particular mine. I had reason to believe that the manager of the mine was not aware of the iron bar being in the mine,—in fact, that in removing all iron bars then in use in this mine when the Act became operative, this particular bar had been overlooked. I did not think it necessary, under the circumstances, to ask your permission to prosecute.

The following is a list of all the mines in my district, both under the Coal Mines Act and under the Metalliferous Mines Act, the former, in accordance with your instructions, showing the names of the certificated managers in each case:—

List of Mines classed under the Coal Mines Regulation Act, in Mr. Willis's District, together with the Names of the Certificated Managers, 1877–78.

1. Collieries in Northumberland.

Owner or Company, and Postal Address.	Name of Colliery.	Where situated.	Certificated Manager.	Remarks.
M. Morrison & Co., Acomb Colliery, Hexham.	Acomb	Hexham	Jos. Roscamp	Coal.
Ashington Coal Co., Ashington Colliery, Morpeth.	Ashington	Morpeth	R. L. Booth	Do.
J. C. Lamb & Co., Backworth Colliery, Newcastle-on-Tyne.	Backworth	Newcastle-on-Tyne.	Wm. Little	Do. and fire-clay.
J. & R. Makepeace, Barcombe Colliery, Bardon Mill.	Barcombe	Haltwhistle	-	Do., Landsale.
Bedlington Coal Co., Bedlington, Morpeth.	Barrington	Morpeth	G. R. Charlton	Do.
J. & B. Armstrong, Bellingham	Bow's Hill	Bellingham	B. Armstrong	Do., Landsale.
N. G. Lambert & Co., Bebside Colliery, Morpeth.	Bebside	Morpeth	John Jackson	Do.
Bedlington Coal Co., Bedlington, Morpeth.	Bedlington	Do.	Jas. Clough	Do.
W. C. Gibson, Scotswood, Newcastle-on-Tyne.	Benwell	Newcastle-on-Tyne.	-	Do. and fire-clay.
Scremerston and Shoreswood Coal Co., Berwick.	Billy Law	Scremerston	James Gavin	Do. do.
A. Goodman & Co., St. Nicholas Buildings, Newcastle-on-Tyne.	Biteabout	Lowick	Wm. Brown	Do., Landsale.
M. Thompson and Sons, Naworth Colliery, Milton, Carlisle.	Blenkinsop	Haltwhistle	J. Croudace	Do.
James Thompson, Brier Edge, Bellingham.	Brieredge	Bellingham	-	Do., Landsale.
Sowerby & Andrews, Broomhill Colliery, Acklington.	Broomhill	Acklington	Andrew Scott	Do. and fire-clay.
John Dixon, Brown Rigg Colliery, Otterburn.	Brown Rigg	Otterburn	-	Do., Landsale.
N. G. Lambert & Co., Bebside Colliery, Morpeth.	Burradon	Newcastle-on-Tyne.	W. Green	Do.
S. Forster & Co., Wylam, Newcastle-on-Tyne.	Callerton	Wylam	-	Do., Landsale.
Cowpen & North Seaton Coal Co., Newcastle-on-Tyne.	Cambois	Blyth	Thos. Moore	Do. and fire-clay.
G. Ridley, Snabdough, Bellingham	Carriteth	Bellingham	-	Do., Landsale.
Chevington Coal Co., Chevington Colliery, Acklington.	Chevington	Chevington	-	Do.
T. Temple, Chirm Colliery, Wingates, Morpeth.	Chirm	Rothbury	-	Do., Landsale.
N. G. Lambert and Co., Bebside Colliery, Morpeth.	Choppington	Morpeth	E. Pringle	Do.
Coanwood Coal Co., Haltwhistle	Coanwood	Haltwhistle	R. Hetherington	Do.
Cowpen & North Seaton Coal Co., Newcastle-on-Tyne.	Cowpen	Blyth	Thos. Hindmarsh.	Do.
N. G. Lambert & Co., Bebside Colliery, Morpeth.	Cox Lodge	Newcastle-on-Tyne.	D. Hetherington	Do. and fire-clay.
Jos. Lamb and Partners, Cramlington Colliery, Cramlington.	Cramlington	Cramlington	R. Linsley	Coal.
J. O. Scott, Delaval Benwell Colliery, Newcastle-on-Tyne.	Delaval Benwell	Newcastle-on-Tyne.	Thos. Potts	Do. and fire-clay.
J. Bowes & Partners, Killingworth Colliery, Newcastle-on-Tyne.	Dinnington	Do.	T. W. Hunter	Do.
R. Faill, Dunshiel Colliery, Elsdon	Dunshiel	Elsdon	-	Do., Landsale.
East Holywell Coal Co., Backworth, Newcastle-on-Tyne.	East Holywell	Earsdon	John Tennant	Coal.
John Johnson, Edgewell Colliery, Prudhoe.	Edgewell	Prudhoe	-	Do. and fire-clay, Landsale.
Ormond & Brown, Eglingham Colliery, Alnwick.	Eglingham	Alnwick	-	Do., Landsale.
Elswick Colliery Co., Newcastle-on-Tyne.	Elswick	Newcastle-on-Tyne.	Thos. Clarence	Do. do.
E. Bainbridge & Co., Eltringham Colliery, Prudhoe.	Eltringham	Prudhoe	Thos. Gilchrist	Do. and fire-clay.
T. Temple, Chirm Colliery, Wingates, Morpeth.	Ewesley	Rothbury	-	Do., Landsale.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Colliery.	Where situated.	Certificated Manager.	Remarks.
Walton & Cowper, Acomb, Hexham.	Fallowfield -	Hexham -	- - -	Coal, Landsale.
Scremerston & Shoreswood Coal Co., Berwick.	Felkington -	Seremerston -	Geo. Southern	Do.
Wm. Hudspith, Haltwhistle -	Fellend -	Haltwhistle -	- - -	Do., Landsale.
M. Hetherington, Ford Moss Colliery, Cornhill-on-Tweed.	Ford Moss -	Ford Moss -	M. Hetherington	Do. do.
Wm. Benson, Montague Main Colliery, Newcastle-on-Tyne.	Fourstones -	Hexham -	S. Pearson -	Do.
L. J. H. Allgood, Gatestones Colliery, Gatestones.	Gatestones -	Wark - -	- - -	Do., Landsale.
J. Bowes & Partners, Killingworth Colliery, Newcastle on-Tyne.	Gosforth -	Newcastle-on-Tyne.	E. W. Crone -	Do.
Thos. Robinson, Gray Mare Hill, Riding Mill.	Grey Mare Hill -	Riding Mill -	- - -	Do., Landsale.
J. & B. Armstrong, Bellingham -	Gunnerton -	Hexham -	B. Armstrong	Do. do.
Thos. Weddle, Standingstone, Matfen.	Halton -	Corbridge -	- - -	Do. do.
J. & B. Armstrong, Bellingham -	Hareshaw Head	Bellingham -	B. Armstrong	Do. do.
Thos. Bates, Heddon Banks, Wylam-on-Tyne.	Heddon - -	Newcastle-on-Tyne.	Thos. Baxter	Do. and fire-clay.
Wm. Walker & Sons, Hedley Colliery, Stocksfield-on-Tyne.	Hedley -	Stocksfield -	- - -	Do., Landsale.
Henshaw & Melkridge Collieries Co., Haltwhistle.	Henshaw and Melkridge -	Haltwhistle -	T. Brown -	Do.
R. Dixon, Hollings Farm, Ebchester, Lintz Green.	Hollings -	Ebchester -	- - -	Do., Landsale.
Jameson & Richley, Hook Hill Mine, Corbridge.	Hook Hill -	Corbridge -	- - -	Fire-clay.
Horsley Coal & Coke Co., Wylam, Newcastle-on-Tyne.	Horsley - -	Wylam -	John Peel -	Coal.
W. J. Nicholson, Horton Colliery, Belford.	Horton -	Wooler -	- - -	Do. Landsale.
John Russel, Ingoe Colliery, Ingoe.	Ingoe - -	Ingoe - -	- - -	Do. do.
J. Bowes & Partners, Killingworth Colliery, Newcastle-on-Tyne.	Killingworth -	Newcastle-on-Tyne.	E. W. Crone -	Do.
Grace & Tone, Kirkheaton Colliery, Capheaton.	Kirkheaton -	Capheaton -	R. Burn -	Do., Landsale.
M. Thompson & Sons, Naworth Colliery, Milton, Carlisle.	Lambley -	Haltwhistle -	J. Croudace -	Do.
Caisley & Turnbull, Lee Colliery, Paperhaugh, Morpeth.	Lee - -	Rothbury -	- - -	Do., Landsale.
G. Nicholson, Long Framlington Colliery, Morpeth.	Long Framlington	Do. -	W. Pattison -	Coal, Landsale.
Rev. E. Lawson, Longhirst, Morpeth.	Longhirst -	Morpeth -	John Smith -	Do.
Longwitton & Greenleighton Coal and Lime Co., Longwitton, Morpeth.	Longwitton -	Longwitton -	- - -	Do.
R. Wright, Lowick Colliery, Lowick, Beal.	Lowick -	Lowick -	- - -	Coal, Landsale.
W. J. Cookson & Co., Mickley Colliery, Prudhoe-on-Tyne.	Mickley -	Prudhoe -	Thos. Bates -	Do.
Elizabeth Bewick, Mickley Bank Colliery, Stocksfield.	Mickley Bank -	Stocksfield -	- - -	Do., Landsale.
Thos. Carr & Son, Scotswood-on-Tyne.	Montague Fireclay.	Newcastle-on-Tyne.	Wm. Rutherford.	Do. and fire-clay.
Wm. Benson & Son, Scotswood-on-Tyne.	Montagu Main	Do. -	T. W. Benson	Do. do.
Cowpen & North Seaton Coal Co., Newcastle-on-Tyne.	Newsham -	Blyth -	Thos. Hindmarsh.	Do.
S. F. Widdrington, Newton-on-the-Moor Colliery, Alnwick.	Newton-on-the-Moor.	Alnwick - -	R. Carr -	Do., Landsale.
Bainbridge & White, North Fenham Colliery, Newcastle-on-Tyne.	North Fenham -	Newcastle-on-Tyne.	C. Gibson -	Do. and fire-clay, Landsale.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Colliery.	Where situated.	Certificated Manager.	Remarks.
Cowpen & North Seaton Coal Co., Newcastle-on-Tyne.	North Seaton	Morpeth	Thos. Moore	Coal and fire-clay, Landsale.
R. Dunn, Wylam-on-Tyne	North Wylam	Wylam	Thos. Hepple	Do.
W. Green, East Woodburn, Newcastle-on-Tyne.	Old Bridge	Woodburn	- - -	Do., Landsale.
W. Stephenson & Sons, Old Throckley Colliery, Newcastle-on-Tyne.	Old Throckley	Newcastle-on-Tyne.	J. T. Cheesman	Do. and fire-clay.
Jas. Chisholm, Otterburn Colliery, Otterburn.	Otterburn	Otterburn	- - -	Do., Landsale.
John Short & Co., Park House Colliery, Morpeth.	Park House	Morpeth	- - -	Do. do.
S. H. Frazer, Pegswood Colliery, Morpeth.	Pegswood	Do.	H. Gibson	Do.
Do. do.	Pegswood Drift	Do.	Do.	Do., Landsale.
Laws, Tone, & Fryer, Plashetts Colliery, Northumberland.	Plashetts	Plashetts	M. Chapman	Do.
Plenmellor Coal Co., Haltwhistle	Plenmellor	Haltwhistle	- - -	Do., Landsale.
Preston Coal Co., North Shields	Preston	North Shields	J. Hardy	Do. and fire-clay.
Turner & Young, Prestwick Colliery, Ponteland.	Prestwick	Prestwick	- - -	Do., Landsale.
W. J. Cookson & Co., Mickley Colliery, Prudhoe-on-Tyne.	Prudhoe	Prudhoe	M. Liddell	Do.
Harrison, Carr, & Co., Radcliffe Colliery, Acklington.	Radcliffe	Acklington	Jas. Atchison	Do.
Wm. Barkus, Rennington Colliery, Alnwick.	Rennington	Alnwick	W. Young	Do., Landsale.
Sir W. G. Armstrong & Co., Ridsdale, Bellingham.	Ridsdale	Woodburn	W. Mundle	Do. do.
Scremerston & Shoreswood Coal Co., Berwick.	Scremerston	Scremerston	James Gavin	Do.
J. Bowes & Partners, Killingworth Colliery, Newcastle-on-Tyne.	Seaton Burn	Newcastle-on-Tyne.	T. W. Hunter	Do.
Seaton Delaval Coal Co., Seaton Delaval.	Seaton Delaval	Do.	T. W. Asquith	Do. and fire-clay.
Jos. Laycock & Co., Seghill Colliery, Newcastle-on-Tyne.	Seghill	Do.	John Douglas	Do.
Shilbottle Coal Co., Shilbottle, Alnwick.	Shilbottle	Alnwick	W. A. Ritson	Do., Landsale.
M. Robson, Falstone.	Shilburn Haugh	Falstone	- - -	Do. do.
J. Baird, Bannamoor, Alnwick	Shipley	Alnwick	- - -	Do. do.
Shire Moor Coal Co., Backworth	Shire Moor	Newcastle-on-Tyne.	A. M. Potter	Do.
W. Cochran Carr, South Benwell, Newcastle-on-Tyne.	South Benwell	Do.	M. Langley	Do. and fire-clay.
Wm. Hudspith, Haltwhistle.	South Tyne	Haltwhistle	R. C. Brown	Do. do.
J. H. Burn, Stobswood Colliery, Acklington.	Stobswood	Widdrington	Wm. Johnson	Do.
Jos. Dinning, Langley Mills, Haydon Bridge.	Stublick	Haydon Bridge	M. Stobart	Do., Landsale.
W. Charlton, Sootyrow Colliery, Wark.	Sootyrow	Wark	- - -	Do. do.
F. H. Hall, Thorngrafton Colliery, Haltwhistle.	Thorngrafton	Haltwhistle	- - -	Do. do.
Throckley Coal Co., Throckley, Newcastle-on-Tyne.	Throckley	Newcastle-on-Tyne.	J. T. Cheeseman.	Do.
Slinn & Woods, Ulgham Grange Colliery, Morpeth.	Ulgham Grange	Morpeth	R. Wood	Do.
J. Drummond, Kilnpithill, Riding Mill.	Unthank	Riding Mill	- - -	Do., Landsale.
N. G. Lambert & Co., Bebside Colliery, Morpeth.	Walker	Newcastle-on-Tyne.	R. Cole	Do.
J. C. Lamb & Co., Backworth Colliery, Newcastle-on-Tyne.	West Cramlington	Do.	Wm. Little	Do.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Colliery.	Where situated.	Certificated Manager.	Remarks.
Bedlington Coal Co., Bedlington, Morpeth.	West Sleekburn	Morpeth	G. R. Charlton	Coal.
W. J. Cookson & Co., Mickley Colliery, Prudhoe-on-Tyne.	West Wylam	Prudhoe	Thos. Bates	Do. and fire-clay.
Whitley & Monkseaton Coal Co., Whitley, Newcastle-on-Tyne.	Whitley	North Shields	Wm. Rutherford.	Do.
John Hall, Whittington Colliery, Corbridge.	Whittington	Corbridge	-	Do., Landsale.
Widdrington Coal Co., Widdrington, Morpeth.	Widdrington	Morpeth	James Hay	Do.
S. Forster and Co., Wylam, Newcastle-on-Tyne.	Wylam Hills	Wylam	Wm. Turnbull	Do. and fire-clay.

2. Collieries in the Northern Division of Durham.

J. Bowes & Partners, Marley Hill, Gateshead.	Andrews House	Gateshead	R. Turnbull	Coal.
R. S. Bagnall & Sons, Axwell Colliery, Whickham.	Axwell	Whickham	W. J. Bates	Do. and fire-clay.
Mary Hannington, Axwell Park Colliery, Swalwell.	Axwell Park	Do.	G. Hall	Do. do.
J. Joicey & Co., Tanfield Lea, Gateshead.	Beamish	Gateshead	E. Nicholson	Do.
E. M. Perkins and Partners, Birtley, Chester-le-Street.	Bewick Main	Do.	T. Hepple	Do. and fire-clay.
Joseph Cowen & Co., Blaydon-on-Tyne.	Blaydon Burn	Blaydon	M. Bates	Do. do.
G. H. Ramsay, Blaydon Main Colliery, Blaydon-on-Tyne.	Blaydon Main	Do.	T. Rutter	Do. do.
Harton Coal Co., Tyne Dock, South Shields.	Boldon	South Shields	Geo. May	Do.
H. Ritson, Broomhill Colliery, Ebchester.	Broomhill	Ebchester	-	Do.
J. Bowes & Partners, Marley Hill, Gateshead.	Burnopfield	Gateshead	Roger Mason	Do. and fire-clay.
Do.	Byermoor	Do.	R. B. Clark	Do. do.
R. Dickinson & Co., South Derwent Colliery, Lintz Green.	Carr House	Consett	T. Lamb	Do. do.
J. Hopper & Co., Deckham Hall Colliery, Gateshead.	Deckham Hall	Gateshead	R. Gustard	Do., Landsale.
R. Dickinson & Co., South Derwent Colliery, Lintz Green.	Dipton	Annfield Plain	J. W. Hodgson	Do.
J. Bowes & Partners, Marley Hill, Gateshead.	Do.	Gateshead	R. Mitchinson	Do.
C. Bainbridge & Co., East Castle Colliery, Lintz Green.	East Castle	Annfield Plain	G. Shipley	Do.
E. M. Bainbridge & Co., East Pontop Colliery, Lintz Green.	East Pontop	Do.	T. Fenwick	Do.
J. Joicey & Co., Tanfield Lea, Gateshead.	East Tanfield	Gateshead	T. Pringle	Do. and fire-clay.
R. Dickinson & Co., South Derwent Colliery, Lintz Green.	Ewehurst Head	Do.	J. W. Hodgson	Do.
E. Hogg, Farnacres Colliery, Teams, Gateshead.	Farnacres	Do.	W. L. Gott	Do. and fire-clay. Landsale.
Sir G. Elliott, Felling Colliery, Gateshead.	Felling	Do.	R. Reed	Do.
Marquis of Bute, Garesfield Colliery, Lintz Green.	Garesfield	Do.	T. W. Bewick	Do. and fire-clay.
R. Forster, Gateshead Fell Colliery, Gateshead.	Gateshead Fell	Do.	-	Do., Landsale.
R. Simpson, Greenside, Ryton-on-Tyne.	Greenside	Ryton	-	Do. do.
H. W. Watson, Hamsterley Colliery, Lintz Green.	Hamsterley	Gateshead	W. Allen	Do. and fire-clay.
J. Joicey and Co., Tanfield Lea, Gateshead.	Handen Hold	Chester-le-Street	E. McKinley	Do.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Colliery.	Where situated.	Certificated Manager.	Remarks.
Harton Coal Co., Tyne Dock, South Shields.	Harton - -	South Shields -	G. May -	Coal.
Tyne Coal Co., Hebburn, Newcastle-on-Tyne.	Hebburn -	Hebburn - -	J.W.Maughan	Do.
Heworth Coal Co., Heworth, Gateshead.	Heworth -	Gateshead -	J. Simpson -	Do. and fire-clay.
Harton Coal Co., Tyne Dock, South Shields.	Hilda - -	South Shields -	G. May -	Do.
J. Joicey & Co., Tanfield Lea, Gateshead.	Kibblesworth -	Gateshead -	R. Mitchinson	Do.
F. McClean, Lintz Colliery, Lintz Green.	Lintz - -	Do. -	R. Reid -	Do. and fire-clay.
J. Bowes & Partners, Marley Hill, Gateshead.	Marley Hill -	Do. -	H. Dixon -	Do. do.
Sir G. Elliott, Penshaw Colliery, Fence Houses.	Penshaw - -	Penshaw -	R. Smith -	Do.
J. Bowes & Partners, Marley Hill, Gateshead.	Pontop - -	Gateshead -	R. Mitchinson	Do.
Fleming & Milling, Redheugh Colliery, Gateshead.	Redheugh -	Do. -	J. Barron -	Do. and fire-clay, standing.
J. Bowes and Partners, Shipcote Colliery, Gateshead.	Shipcote - -	Do. -	Alex. Ross -	Do., Landsale.
J. F. Swinburne, Birtley, Chester-le-Street.	South Birtley -	Do. -	- - -	Do. do.
R. Dickinson & Co., South Derwent Colliery, Lintz Green.	South Derwent -	Annfield Plain -	T. Lamb -	Do.
M. Richardson, South Garesfield Colliery, Lintz Green.	South Garesfield	Gateshead -	G. Hall -	Do. and fire-clay.
Trustees of T. Vaughan & Co., South Medomsley Colliery, Dipton, Lintz Green.	South Medomsley	Do. -	B. Shipley -	Do. do.
E. M. Perkins & Partners, Birtley, Chester-le-Street.	South Pelaw -	Chester-le-Street	T. Hepple -	Do.
Ritson & Co., South Pontop Colliery, Annfield Plain.	South Pontop -	Annfield Plain -	H. Green -	Do.
J. Joicey & Co., Tanfield Lea, Gateshead.	South Tanfield -	Gateshead -	P. Kay - -	Do.
J. Bowes & Partners, Marley Hill, Gateshead.	Springwell -	Do. -	R. T. Swallow	Do.
J. Joicey & Co., Tanfield Lea, Gateshead.	Stanley - -	Chester-le-Street	E. Nicholson -	Do.
A. E. Burdon, Team Colliery, Gateshead.	Team - -	Gateshead -	B. Fenwick -	Do. and fire-clay.
J. Joicey & Co., Tanfield Lea, Gateshead.	Tanfield Moor -	Do. -	T. Pringle -	Do.
Stella Coal Co., Blaydon-on-Tyne	Townley & Stella	Blaydon - -	W. Rochester	Do. and fire-clay.
J. Joicey & Co., Tanfield Lea, Gateshead.	Twizell - -	Chester-le-Street	J. Humble -	Do.
G. Wythes, Tyne Main Colliery, Gateshead.	Tyne Main -	Gateshead -	E. Hamilton -	
E. M. Perkins & Partners, Birtley, Chester-le-Street.	Urpeth - -	Do. -	T. Hepple -	Do.
Elliott & Johnassonn, Usworth Colliery, Washington Station.	Usworth - -	Do. -	J. Robinson -	Do.
Priestman & Peel, Victoria Garesfield Colliery, Lintz Green.	Victoria Garesfield.	Do. -	G. Franks -	Do. and fire-clay.
J. Bowes & Partners, Wardley Colliery, Newcastle-on-Tyne.	Wardley -	Do. -	M. Robinson -	Do.
W. Stobart, Washington Colliery, Washington Station.	Washington -	Do. -	G. Charlton -	Do.
Wearmouth Coal Co., Sunderland.	Wearmouth -	Sunderland -	J. Cowey -	Do.
J. Joicey & Co., Tanfield Lea, Gateshead.	West Pelton -	Chester-le-Street	E. McKinley -	Do.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Colliery.	Where situated.	Certificated Manager.	Remarks.
Whitburn Coal Co., Whitburn, Sunderland.	Whitburn -	Sunderland -	H. Douglas -	Sinking.
R. Dickinson & Co., South Derwent Colliery, Lintz Green.	West Shield Row	Annfield Plain -	T. Lamb -	Coal.
J. Snowball & Son, Whickham Colliery, Gateshead.	Whickham -	Gateshead -	G. H. Snowball	Do., Landsale.
	3. Collieries in Cumberland.			
Fletcher & Co., Mealsgate, Carlisle.	Allhallows -	Aspatria - -	T. P. Martin	Coal.
Trustees of the late W. Irving, Asby Colliery, Arlecdon.	Asby - -	Arlecdon - -	E. Kirkbridge	Do.
M. Thompson & Sons, Naworth Colliery, Milton, Carlisle.	Bishop Hill -	Milton - -	J. W. Nicholson.	Do.
Maryport Hematite Iron Co., Maryport.	Bolton - -	Aspatria -	C. Steele -	Do.
Whitehaven Hematite Iron Co., Whitehaven.	Bowthorn -	Cleator Moor -	J. Brown -	Do.
Trustees of the late J. Harris, Brayton Domain Colliery, Aspatria.	Brayton Domain	Aspatria -	T. Young -	Do.
R. Wilson, Flimby Collieries, Maryport.	Broughton Moor	Maryport -	M. Watson -	Do.
R. S. Mutch, Camerton Colliery, Maryport.	Camerton -	Do. -	J. Clarke -	Do. and fire-clay.
West Cumberland Iron & Steel Co., Workington.	Clifton - -	Workington -	J. Spence -	Do. do.
Mulcaster & Partners, Crosby and Gilcrux Collieries, Maryport.	Crosby - -	Maryport -	J. Mulcaster -	Do.
G. Greveson & Co., Dean Moor Colliery, Workington.	Dean Moor -	Cockermouth -	- - -	Do.
J. Osmaston, Dearham, Carlisle -	Dearham -	Carlisle -	R. Short -	Do.
Harris & Carlton, Dovenby Colliery, Maryport.	Dovenby - -	Maryport -	T. Carlton -	Do.
Parker & Co., Flimby, Maryport	Eagle Gill -	Do. -	- - -	Do. and fire-clay.
Maryport Hematite Iron Co., Maryport.	Ellenborough -	Do. -	J. Faulder -	Do.
R. Wilson, Flimby Collieries, Maryport.	Flimby - -	Do. -	M. Watson -	Do. and fire-clay.
Frizington Coal Co., Frizington, Whitehaven.	Frizington -	Whitehaven -	C. Christian -	Do.
Mulcaster & Partners, Crosby & Gilcrux Collieries, Maryport.	Gilcrux - -	Maryport -	W. Penn -	Do.
H. Graves, Gill Head Colliery, Maryport.	Gill Head -	Do. -	- - -	Do. and fire-clay.
James Bain & Co., Harrington, Workington.	Harrington -	Workington -	T. Glaister -	Do. do.
M. Thompson & Sons, Milton, Carlisle.	Howard - -	Milton - -	J. W. Nicholson.	Do.
J. C. Brown & Co., Lamplugh Colliery, Ullock, Cockermouth.	Lamplugh -	Lamplugh -	J. Ramsay -	Do.
M. Thompson and Sons, Naworth Colliery, Milton, Carlisle.	Midgeholme -	Haltwhistle -	J. Croudace -	Do.
Moresby Coal Co., Whitehaven -	Moresby - -	Whitehaven -	J. Ramsay -	Do.
Marron Brick Co., Grey Southen -	New Banks -	Grey Southen -	G. Cameron -	Do. and fire-clay.
Saint Helen's Colliery Co., 39, High Street, Maryport.	Saint Helen's -	Maryport -	T. Whitehead	Do. do.
Cope & Co., Seaton Fire-brick Works, Workington.	Seaton - -	Workington -	- - -	Do. do.
Earl of Lonsdale, Whitehaven -	Whitehaven -	Whitehaven -	W. Harker, R. W. Moore.	Do.
J. Blair, Wythemoor Colliery, Harrington.	Wythemoor -	Workington -	W. Martin -	Do. and fire-clay.

List of Mines under the Metalliferous Mines Regulation Act, in Mr. Willis's District, 1877–78.

Owner or Company, and Postal Address.	Name of Mine.	Where situated.	Remarks.
1. LEAD ORE, ZINC ORE, AND BARYTES MINES IN CUMBERLAND.			
Ayle Burn Mining Co., Alston	Ayle Burn	Alston	Exploring.
Alston Moor Mining Co., Alston	Benty Field	Ditto	Lead ore.
Blagill Mine Co., Alston	Blagill	Ditto	Barytes.
Brownley Hill Mining Co., Alston.	Brownley Hill	Ditto	Lead and zinc ore.
Calvert Mine Co., Alston	Calvert	Alston	Exploring.
Dr. De Mey & Co., Cash Well Mine, Alston.	Cash Well	Ditto	Lead ore.
Dowgang Mine Co., Nenthead, Alston.	Dowgang	Nenthead	Lead and zinc ore.
John Carruthers & Co., Dowpot Syke, and Gattergill Mines, Alston.	Dowpot Syke and Gattergill.	Alston.	Lead ore.
Force Cray Mining Co., Main Street, Cockermouth.	Force Cray	Braithwaite	Barytes.
London Lead Co., Nenthead, Alston.	Garrigill	Nenthead	Ditto.
West Cumberland Consols, Wythburn, Keswick.	Helvellyn	Keswick	Exploring.
Holyfield Mining Co., Alston	Holyfield	Alston	Ditto.
Middle Syke Mining Co., Alston	Middle Syke	Ditto	Ditto.
London Lead Co., Nenthead, Alston.	Nenthead	Nenthead	Lead and zinc ore.
Alston Moor Mining Co., Alston	Nentsberry	Alston	Ditto.
Dr. De Mey & Co., Cash Well Mine, Alston.	Patter Syke	Tynehead	Lead ore.
Wilson & Co., Rodderup Fell Mines, Alston.	Rodderup Fell	Alston	Ditto.
2. IRON ORE MINES IN CUMBERLAND.			
Lord Leaconfield, Bigrigg, &c., Mines, Cleator, Whitehaven.	Bigrigg and Cleator Moor.	Cleator Moor	Iron ore.
Jos. Fearon, Birks Mine, Frizington.	Birks	Frizington	Ditto.
Cleator Iron Ore Co., Cleator, Carnforth.	Cleator	Cleator Moor	Ditto.
Crossfield Iron Ore Co., Moor Row, Carnforth.	Crossfield	Ditto	Ditto.
Maryport Hematite Iron Co., Maryport.	Crossgill	Frizington	Ditto.
Dyke Nook Mining Co., S. Queen Street, Whitehaven.	Dyke Nook	Ditto	Ditto.
Egremont Mining Co., 34, Grey Street, Newcastle-on-Tyne.	Egremont	Egremont	Ditto.
Ehen Mining Co., 36, Lowther Street, Whitehaven.	Ehen	Ditto	Ditto
Ennerdale and Kelton Fells Mining Co., Lamplugh, Cockermouth.	Ennerdale and Kelton Fells.	Lamplugh	Ditto.
Eskett Iron Ore Co., Whitehaven.	Eskett	Eskett	Ditto.
James Bain & Co., Woodend, Cleator Land End, Carnforth.	Frizington Parks	Cleator Moor	Ditto.
Ditto ditto	Goosegreen	Ditto	Ditto.
Fletcher and Hodgetts, Saint Bees, Carnforth.	High House and High Cross Gill.	Frizington	Ditto.
Hodbarrow Mining Co., Millom, Carnforth.	Hodbarrow	Millom	Ditto.
Dalmellington Iron Co., Frizington, Carnforth.	Holebeck and Rattenrow.	Frizington	Ditto.
Wm. David & Co., Lamplugh, Cockermouth.	Kelton and Knockmurton.	Lamplugh	Ditto.
S. and J. Lindow, Cleator, Carnforth.	Longlands	Cleator Moor	Ditto.
Ditto ditto	Lonsdale	Frizington	Ditto.
John Stirling, Montreal Mines, Whitehaven.	Montreal	Whitehaven	Ditto.
Moor Row Mining Co., 36, Lowther Street, Whitehaven.	Moor Row	Ditto	Ditto.
Maryport Hematite Iron Co., Maryport.	Moor Row	Ditto	Ditto.

Owner or Company, and Postal Address.	Name of Mine.	Where situated.	Remarks.
	IRON ORE MINES IN CUMBERLAND—*continued.*		
Mowbray Iron Ore Co., Whitehaven.	Mowbray	Frizington	Iron ore.
Whitehaven Iron Mines Co., Ravenglass, Carnforth.	Nabb Gill	Eskdale	Ditto.
New Parkside Mining Co., Egremont.	New Parkside	Frizington	Ditto.
Parkside Mining Co., 36, King Street, Whitehaven.	Parkside	Ditto	Ditto
John Postlethwaite, Fairview, Eskett, Carnforth.	Postlethwaite's Eskett	Eskett	Ditto.
Salter and Eskett Park Mining Co., 14, Tangier Street, Whitehaven.	Salter and Eskett Park.	Salter and Eskett	Ditto.
Thos. Dixon & Co., Cleator, Carnforth.	Salter Hall	Cleator	Ditto.
Scalelands Mining Co., Frizington, Carnforth.	Scalelands	Frizington	Ditto.
S. & J. Lindow, Cleator, Carnforth.	Sir John Bigrigg and Meadow.	Woodend	Ditto.
Winder Iron Ore Co., Frizington, Carnforth.	Winder	Frizington	Ditto.
Maryport Hematite Iron Co., Maryport.	Windergill	Winder	Ditto.
James Bain & Co., Woodend, Cleator Land End, Carnforth.	Woodend	Cleator Moor	Ditto.
Wyndham Mining Co., 69, King Street, Whitehaven.	Wyndham	Egremont	Ditto.
	3. COPPER MINES IN LANCASHIRE.		
Coniston Mining Co., Coniston, Ambleside.	Coniston	Coniston	Copper ore.
	4. IRON ORE MINES IN LANCASHIRE.		
Furness Iron & Steel Co., Askam-in-Furness.	Askam	Dalton-in-Furness	Iron ore.
Kellett & Marr, Lindal-in-Furness, Ulverston.	Bercune	Ulverston	Ditto.
Denney Bros. & Co., Ulverston	Dalton	Dalton-in-Furness	Ditto.
Furness Iron and Steel Co., Askam-in-Furness.	Dalton	Ditto	Ditto.
Trustees of late G. B. Ashburner, Elliscales, Dalton-in-Furness.	Elliscales	Ditto	Ditto.
Furness Iron and Steel Co., Askam-in-Furness.	Goldmire	Ditto	Ditto.
Cumberland Iron Mining and Smelting Co., Milton, Cumberland.	Highfield	Dalton-in-Furness	Ditto.
Ulverston Mining Co., 3, Benson Street, Ulverston.	Lindal Cote	Lindal-in-Furness	Ditto.
Furness Iron and Steel Co., Askam-in-Furness.	Lindal Moor	Ditto	Ditto.
Harrison, Ainslie, and Co., Ulverston.	Lindal Moor	Ditto	Ditto.
Lindal & Ousby Iron Ore Co., Little Urswick, Ulverston.	Lindal and Ousby	Little Urswick	Ditto.
Duke of Buccleuch, Millwood, Dalton-in-Furness.	Longlands	Dalton-in-Furness	Ditto.
John Clegg, Mouzell Mines, Dalton-in-Furness.	Mouzell	Ditto	Ditto.
Barrow Hematite Steel Co., Dalton-in-Furness.	Newton	Ditto	Ditto.
Ditto ditto	Old Hills	Ditto	Ditto.
Ditto ditto	Park	Ditto	Ditto.
Parkside Mining Co., 36, King Street, Whitehaven.	Pennington and Urswick.	Ulverston	Ditto.
Kennedy Bros., Ulverston	Roanhead and Askam	Dalton-in-Furness	Ditto.
Stainton Mining Co., 3, Benson Street, Ulverston.	Stainton	Urswick	Iron pyrites.
Barrow Hematite Steel Co., Dalton-in-Furness.	Stainton	Datlon-in-Furness	Iron ore.
Ditto ditto	Stank	Ditto	Ditto.
Ditto ditto	Whitriggs	Ditto	Ditto.
Yarlside Mining Co., Parkhouse, Dalton-in-Furness.	Yarlside	Ditto	Ditto.

Owner or Company, and Postal Address.	Name of Mine.	Where situated.	Remarks.
5. LEAD ORE, BARYTES, UMBER, AND WHINSTONE MINES IN NORTHUMBERLAND.			
Walton & Cowper, Acomb, Hexham.	Fallowfield - -	Hexham - -	Lead ore and barytes.
J. P. Walton and Co., Acomb, Hexham.	Haydon - -	Haydon Bridge -	Exploring.
Bewick and Partners, Haydon Bridge.	Langley Barony -	Ditto - -	Lead ore and whinstone.
Long Cleugh Mining Co., Nine Banks, Langley Mills.	Long Cleugh -	Whitfield - -	Exploring.
R. R. Buck, Carrock House, Carlisle.	Moralee Fell -	Haydon Bridge - -	Ditto.
F. W. Hall, Settingstones Mines, Fourstones.	Settingstones -	Hexham - -	Barytes.
Stonecroft & Greyside Mining Co., Fourstones.	Stonecroft and Greyside.	Ditto - -	Lead Ore.
Tepper Moor Mining Co., Wall -	Tepper Moor -	Ditto - - -	Exploring.
Thornbrough Mine Co., Corbridge.	Thornbrough -	Corbridge - -	Ditto.
Water House Mine Co., Haydon Bridge.	Water House -	Haydon Bridge - -	Umber.

General Remarks.

In March my attention was called to the report of a speech made at a meeting of the miners of Messrs. Bain and Co.'s collieries at Harrington, Cumberland, in which it was alleged that the No. 7 pit belonging to those collieries was in a dangerous state owing to considerable quantities of standing gas being in close proximity to the workmen. I immediately had the pit carefully inspected, and found the statement to be fairly well substantiated, so much so, that, with your permission, I took out summonses against Mr. J. S. Simpson as agent (he is also one of the partners), and Mr. James Glaister as manager. The charges were laid under the 1st and 4th general rules, for not having an adequate amount of ventilation, and for not fencing entrances to places not in actual course of working. The cases were heard at the Whitehaven Petty Sessions on 16th May, and the offences were admitted. Penalties of 10*l.* each, with costs, were inflicted in the first case, and seeing this was a substantial penalty, with the approbation of the magistrates, I consented to withdraw the second case.

On the 5th November, Mr. Thomas Ware, agent of the Stonecroft and Greyside Lead Ore Mines, appeared in answer to a summons, for not properly fencing the entrance between the top and bottom of a working shaft in the said mine, as required by general rule 7 of the Metalliferous Mines Act. Evidence was given (*see* remarks on No. 14 fatal accident, metalliferous mines) and the offence admitted, the justices inflicting a penalty of 1*l.* and costs, but intimating that if a case of the same nature came before them again they would inflict the full penalty.

Mr. J. B. Atkinson has acted as my assistant during the year and has done valuable work. His report to me of work done is thus divided :—Inspections underground and on surface have occupied 220 days, attending inquests 19 days, office work 51 days, attending court and solicitors 5 days, and absent on leave 12 days. My own work has been 207 days visiting mines and collieries, 38 days meeting managers and others for consultation and inquiry 9 days in London on official duty, 10 days in connection with prosecutions, remainder in office work and other matters of duty. Thorough underground inspections, not connected with accidents, have numbered, by myself and assistant, 42 ; underground examinations, connected with accidents, about 85.

I have, &c.,
JAMES WILLIS.

The Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department, Whitehall, London.

Report of Assistant Inspector.

Ridley Mill, Stocksfield, Newcastle-on-Tyne,
26th March 1879.

Sir,

In pursuance of section 48 of the Coal Mines Regulation Act, 1872, and of section 20 of the Metalliferous Mines Regulation Act, 1872, I have the honour to report that during the past year I have exercised the duties of Inspector in the Newcastle-on-Tyne district, and that in doing so I acted as assistant to and under the directions of Mr. Willis.

I have, &c.,
J. B. ATKINSON.

The Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department.

Mr. Bell's Report.

REPORT on the INSPECTION of MINES in the DURHAM DISTRICT, comprising the southern portion of the county of DURHAM, the county of WESTMORELAND, and the North Riding of the county of YORK, under the Coal Mines Regulation Act, 1872, and the Metalliferous Mines Regulation Acts, 1872 and 1875, from the 1st day of January to the 31st day of December 1878, inclusive.—By THOMAS BELL, Esq.

SIR, Durham, 31st March 1879.

I HAVE the honour to transmit for your consideration my annual report on the working of the Coal and Metalliferous Mines Regulation Act in the Durham district during the year 1878, together with the usual schedules of accidents which have occurred during that period, and the lists of collieries and other mines, also the produce of minerals.

The fatal accidents which have taken place in and about the mines during the year have caused the deaths of 83 persons in the coal mines, 17 in the ironstone mines of Cleveland, and 5 in the metalliferous mines, or a total of 105 lives lost, against 120 during the previous year, being a decrease of 15 deaths in the aggregate, viz.: 12 in coal mines, 4 in ironstone mines, and an increase of 1 death in the metalliferous mines. It will be observed that there is a large falling off in the production of minerals in the different sections of the district, as well as a falling off in the number of persons employed in and about the mines.

I will now proceed with the statistical tables usually given in these reports, showing the quantity of mineral wrought and number of persons employed in and about the mines comprised within the Coal Mines Regulation Act.

Table No. 1.

	South Durham.	Westmoreland.	North Riding of York.	Totals.
Minerals wrought in 1878:	Tons.	Tons.	Tons.	Tons.
Coal	18,612,246	1,830	6,836	18,620,912
Fire-clay	227,046	—	4,350	231,396
Ironstone	—	—	5,316,477	5,316,477
Totals	18,839,292	1,830	5,327,663	24,168,785
Comparisons for the Year 1877	19,847,652	2,051	6,297,830	26,147,523

Table No. 2 gives the number of persons of the different ages employed in and about the mines under the Coal Mines Regulation Act during the year 1878.

	Underground.					Above Ground.							Total above and below Ground.
	Male Persons, Ages.					10 to 13.		13 to 16.		Above 16.		Total.	
	10 to 12.	12 to 13.	13 to 16.	Above 16.	Total.	Males.	Females.	Males.	Females.	Females.	Males.		
South Durham	—	782	4,220	37,778	42,780	204	—	1,119	1	8	8,777	10,109	52,889
Westmoreland	—	—	—	15	15	—	—	—	—	—	2	2	17
North Yorkshire	—	16	283	5,355	5,654	12	—	89	—	—	1,036	1,137	6,791
Totals for 1878	—	798	4,503	43,148	48,449	216	—	1,208	1	8	9,815	11,248	59,697
Comparisons for 1877.	—	1,128	5,087	45,784	51,999	320	—	1,406	1	6	11,282	13,015	65,014

Table No. 3 shows a comparison of the number of tons of mineral wrought in statute tons, persons employed, lives lost, tons of mineral wrought per life lost, &c., during the past three years, for the South Durham and Westmoreland portion of the district.

	1876.	1877.	1878.
Number of persons employed -	58,380	56,445	52,906
Quantity of mineral raised in tons -	19,921,851	19,849,703	18,841,122
Separate fatal accidents - -	75	95	78
Lives lost by the accidents -	78	95	83
Persons employed per separate fatal accident.	778	595	680
Persons employed per life lost -	748	595	638
Tons of mineral raised per separate fatal accident.	265,625	208,944	241,553
Tons of mineral raised per life lost -	255,408	208,944	227,002

The Table No. 4 gives a similar comparison for the North Riding portion of the district.

	1876.	1877.	1878.
Number of persons employed -	9,851	8,569	6,791
Quantity of mineral raised in tons -	6,571,968	6,297,820	5,327,663
Separate fatal accidents - -	16	21	17
Lives lost by the accidents - -	16	21	17
Persons employed per separate fatal accident.	616	408	399
Persons employed per life lost -	616	408	399
Tons of mineral raised per separate fatal accident.	410,748	299,896	313,392
Tons of mineral raised per life lost -	410,748	299,896	313,392

Table No. 5 shows the district in its entirety, and renders the comparison more complete by placing the three years figures given in the foregoing tables in juxtaposition with similar figures appertaining to the whole kingdom, thus :—

	Durham District. 1876.	Durham District. 1877.	Durham District. 1878.	In the whole Kingdom. 1878.
Number of persons employed - -	68,231	65,014	59,697	475,329
Quantity of mineral raised in tons -	26,493,819	26,147,523	24,168,785	145,798,138
Separate fatal accidents - - -	91	116	95	811
Lives lost by the accidents - -	94	116	100	1,413
Persons employed per separate fatal accident - - - -	750	560	628	586
Persons employed per life lost - -	726	560	597	336
Tons of mineral raised per separate fatal accident - - - -	291,141	225,409	254,408	179,777
Tons of mineral raised per life lost -	281,849	225,409	241,688	103,177

The following table, No. 6, gives a general summary of mining produce from both the coal and metalliferous mines, together with the total number of persons employed in and about the mines in the whole of the Durham district, for the past three years :—

	1876.	1877.	1878.
Coal, statute tons - - -	19,520,923	19,556,418	18,620,912
Fire-clay, statute tons - -	408,795	301,360	231,396
Ironstone, statute tons - -	6,564,101	6,289,745	5,316,477
Metalliferous mining produce, statute tons.	54,363	84,861	68,239
Total -	26,548,182	26,232,384	24,237,024

	1876.	1877.	1878.
Persons employed			
Underground - - -	56,691	54,679	51,087
Above ground - - -	15,375	14,367	12,503
Total -	72,066	69,046	63,590

Table No. 7 shows the number of fatal accidents and deaths that have resulted therefrom in and about the mines in the South Durham and Westmoreland portions of this district during the past five years, 1874 to 1878 inclusive.

	Number of separate Accidents. Year.					Number of Deaths resulting. Year.				
	1874.	1875.	1876.	1877.	1878.	1874.	1875.	1876.	1877.	1878.
Explosions of Fire-damp -	2	1	2	1	3	2	1	5	1	4
Falls in Mine.										
Falls of sides - - - -	4	–	6	5	2	4	–	6	5	2
Falls of roof - - - -	19	35	36	32	34	20	35	36	32	35
Total falls in mine - -	23	35	42	37	36	24	35	42	37	37
In Shafts.										
Overwinding - - - -	2	–	–	–	–	2	–	–	–	–
Ropes and chains breaking - -	1	1	–	–	–	1	1	–	–	–
Whilst ascending or descending -	5	5	–	1	–	5	5	–	1	–
Falling into shaft from surface -	1	–	1	–	1	1	–	1	–	1
Things falling from top of shaft -	–	1	–	2	–	–	1	–	2	–
Falling from part way down -	3	1	2	2	–	3	1	2	2	–
Things falling from part way down	–	–	1	2	1	–	–	1	2	1
Sundries in shafts - - -	2	2	1	5	5	2	2	1	5	5
Total in shafts - -	14	10	5	12	7	14	10	5	12	7
Miscellaneous Underground.										
Explosions of gunpowder - -	1	3	1	3	–	1	3	1	3	–
Suffocation by gases - - -	1	–	–	–	–	1	–	–	–	–
Irruptions of water - - -	–	–	–	–	1	–	–	–	–	1
Falling into water - - -	–	–	–	–	–	–	–	–	–	–
On incline and engine planes -	3	1	5	7	7	3	1	5	7	7
By trams or tubs - - -	16	10	7	10	7	17	10	7	10	7
By machinery - - - -	2	2	–	2	2	2	2	–	2	2
Sundries - - - - -	–	1	2	4	5	–	1	2	4	8
Total miscellaneous underground	23	17	15	26	22	24	17	15	26	25
Total underground - - -	62	63	64	76	68	64	63	67	76	73
On Surface.										
By machinery - - - -	1	2	2	1	1	1	2	2	1	1
By boilers bursting - - -	–	–	–	–	–	–	–	–	–	–
By sundries - - - -	11	11	9	18	9	11	11	9	18	9
Total on surface - -	12	13	11	19	10	12	13	11	19	10
Gross Totals - -	74	76	75	95	78	76	76	78	95	83

Table No. 8 shows the number of fatal accidents and deaths resulting therefrom, in and about the Cleveland (Ironstone Mines) portion of the district, during the past five years, 1874 to 1878 inclusive.

	Number of separate Accidents.					Number of Deaths resulting.				
	Year.					Year.				
	1874.	1875.	1876.	1877.	1878.	1874.	1875.	1876.	1877.	1878.
EXPLOSIONS OF FIRE-DAMP	—	—	1	1	—	—	—	1	1	—
FALLS IN MINE.										
Falls of sides	5	10	5	7	4	5	11	5	7	4
Falls of roof	2	2	2	3	3	2	2	2	3	3
Total falls in mine	7	12	7	10	7	7	13	7	10	7
IN SHAFTS.										
Overwinding	—	—	—	—	—	—	—	—	—	—
Ropes and chains breaking	—	—	—	—	—	—	—	—	—	—
Whilst ascending or descending	—	1	—	—	—	—	1	—	—	—
Falling into shaft from surface	—	—	—	—	—	—	—	—	—	—
Things falling from top of shaft	—	—	—	—	—	—	—	—	—	—
Falling from part way down	—	—	—	—	—	—	—	—	—	—
Things falling from part way down	—	1	—	—	—	—	1	—	—	—
Sundries in shafts	—	1	—	—	—	—	1	—	—	—
Total in shafts	—	3	—	—	—	—	3	—	—	—
MISCELLANEOUS UNDERGROUND.										
Explosions of gunpowder	2	—	—	—	1	2	—	—	—	1
Suffocation by gases	—	—	—	—	—	—	—	—	—	—
Irruptions of water	—	—	—	—	—	—	—	—	—	—
Falling into water	—	—	—	—	—	—	—	—	—	—
On incline and engine planes	—	—	1	—	3	—	—	1	—	3
By trams or tubs	6	9	—	6	2	6	9	—	6	2
By machinery	—	—	—	1	—	—	—	—	1	—
Sundries	—	3	2	—	3	—	3	2	—	3
Total miscellaneous underground	8	12	3	7	9	8	12	3	7	9
Total underground	15	27	11	18	16	15	28	11	18	16
ON SURFACE.										
By machinery	1	—	1	—	—	1	—	1	—	—
By boilers bursting	—	—	—	—	—	—	—	—	—	—
By sundries	4	1	4	3	1	4	1	4	3	1
Total on surface	5	1	5	3	1	5	1	5	3	1
GROSS TOTALS	20	28	16	21	17	20	29	16	21	17

Table No. 9 gives the per-centage of accidents for the last three years, placed in the positions they stand on the schedules under the five different headings for both portions of the district, viz. :—

	1876.		1877.		1878.	
Coal Mines.	Deaths.	Per cent.	Deaths.	Per cent.	Deaths.	Per cent.
Explosions of fire-damp	5	6·41	1	1·05	4	4·82
Falls in mine	42	53·85	37	38·95	37	44·58
In shafts	5	6·41	12	12·63	7	8·43
Miscellaneous underground	15	19·23	26	27·37	25	30·12
On surface	11	14·10	19	20·00	10	12·05
	78	100·00	95	100·00	83	100·00
Ironstone Mines in Cleveland.						
Explosions of fire-damp	1	6·25	1	4·76	—	
Falls in mine	7	43·75	10	47·62	7	41·18
In shafts	-	-	-	-	-	-
Miscellaneous underground	3	18·75	7	33·33	9	52·94
On surface	5	31·25	3	14·29	1	5·88
	16	100·00	21	100·00	17	100·00

Metalliferous Mines.

The following Table No. 10 is a summary of the produce of the whole of the metalliferous mines in the Durham district for the past three years :—

	1876.	1877.	1878.
Lead ore, dressed, tons	20,199	20,809	17,932
,, undressed, tons	3,617	3,585	1,610
Copper ore, tons	—	—	—
Zinc ore, tons	—	—	—
Iron ore, tons	14,961	39,858	19,204
Slate, dressed, tons	2,351	2,413	2,193
,, undressed, tons	—	80	—
Building stone	—	—	160
Flags, dressed, tons	—	1,830	8,640
,, undressed, tons	—	250	2,205
Whinstone, tons	13,235	16,036	16,295
Jet	no returns	no returns	no returns
Totals	54,363	84,861	68,239

Table No. 11 is a summary of persons employed in and about the metalliferous mines, and the gross quantity of mineral produced in each of the different counties, comprising the Durham district, for the year under notice.

Situation of Mines.	Underground. Male Persons' Ages. 12 to 13	13 to 16	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total underground and above ground.	Kind of Mineral.	Mining Produce. Dressed mineral.	Undressed mineral sold, treated, or used.
														Tons.	Tons.
County of Durham	—	2	1,472	1,474	24	—	356	2	—	430	812	2,286	Lead ore	11,961	1,413
,,	—	—	99	99	—	—	6	—	—	11	17	116	Whinstone	19,204	—
,,	—	1	10	11	—	—	1	—	—	4	5	16	Iron ore	3,693	—
Totals	—	3	1,581	1,584	24	—	363	2	—	445	834	2,418	—	34,858	1,413

Situation of Mines.	Underground. Male Persons' Ages. 12 to 13	13 to 16	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total underground and above ground.	Kind of Mineral.	Mining Produce. Dressed mineral.	Undressed mineral sold, treated, or used.
														Tons.	Tons.
County of Northumberland.	—	—	111	111	5	—	12	—	—	3	20	131	Lead ore	165	197
County of Cumberland	—	—	4	4	—	—	—	—	—	—	—	4	Lead ore	—	—
County of Westmoreland.	—	—	120	120	4	—	30	—	—	69	103	223	Lead ore	1,581	—
" "	—	—	—	—	—	—	—	—	—	—	—	—	Iron ore	—	—
" "	—	15	55	70	—	—	5	—	—	40	45	115	Slate	2,193	—
" "	—	—	—	—	—	—	—	—	—	—	—	—	Building stone.	60	—
" "	—	—	—	—	—	—	—	—	—	—	—	—	Gypsum	—	—
Totals	—	15	175	190	4	—	35	—	—	109	148	338	—	3,834	—
Yorkshire, N.R.	3	49	638	690	6	1	59	2	5	146	219	909	Lead ore	4,225	—
"	—	—	—	—	—	—	—	—	—	—	—	—	Iron ore	—	—
"	—	1	16	17	1	—	4	—	—	9	14	31	Whinstone	12,602	—
"	—	1	41	42	—	—	3	—	—	17	20	62	Flags	8,640	2,205
"	—	—	—	—	—	—	—	—	—	—	—	—	Building stone.	100	—
"	—	—	—	—	—	—	—	—	—	—	—	—	Jet	No returns.	
Totals	3	51	695	749	7	1	66	2	5	172	253	1,002	—	25,567	2,205
Totals for the district, 1878	3	69	2,566	2,638	40	1	476	4	5	729	1,255	3,893	—	64,424	3,815
Comparisons for 1877	5	65	2,610	2,680	70	1	514	2	7	758	1,352	4,032	—	80,946	3,915

The following is a list of the metalliferous mines in this district, showing the gross number of persons employed both under and above ground by each company, and in each county, together with the quantity of mineral produced, both dressed and undressed, for the year under notice:—

	Persons Employed. Underground.	Above Ground.	Total.	Kind of Mineral.	Mineral Dressed. Tons.	Cwts.	Qrs.	Undressed Mineral sold, treated, or used. Tons.	Cwts.	Qrs.
County of Durham.										
W.B. Mines in Weardale	668	334	1,002	Lead ore	4,102	—	—	1,413	—	—
London Lead Co., do.	266	80	346	"	2,152	—	—	—	—	—
Ditto, Teesdale	322	245	567	"	4,617	—	—	—	—	—
Derwent Mining Co., Jeffreys	95	55	150	"	418	—	—	—	—	—
Healey Field Mining Co.	23	22	45	"	39	—	—	—	—	—
Rookhope do.	40	36	76	"	326	—	—	—	—	—
Green Hurth do.	8	7	15	"	180	—	—	—	—	—
Harwood do.	4	—	4	"	15	—	—	—	—	—
Dubby Sike do.	4	—	4	"	—	—	—	—	—	—
Isabella do.	6	12	18	"	34	—	—	—	—	—
Martha do.	2	—	2	"	—	—	—	—	—	—
Langdon do.	—	—	—	"	—	—	—	—	—	—
Teesdale do.	12	4	16	"	40	—	—	—	—	—
Upper Teesdale do.	2	—	2	"	—	—	—	—	—	—
East and West Pikelaw Mining Co.	—	7	7	"	22	—	—	—	—	—
Grass Hill Mining Co.	6	2	8	"	16	—	—	—	—	—
Hexham and Edmondbyers Mining Co.	12	8	20	"	—	—	—	—	—	—
Willeyhole Mining Co.	4	—	4	"	—	—	—	—	—	—
Sunniside do.	—	—	—	"	—	—	—	—	—	—
Harehope Gill do.	—	—	—	"	—	—	—	—	—	—

	Persons Employed.			Kind of Mineral.	Mineral Dressed.			Undressed Mineral sold, treated, or used.		
	Under-ground.	Above Ground.	Total.		Tons.	Cwts.	Qrs.	Tons.	Cwts.	Qrs.
Hargill Mining Co.	7	2	9	Whinstone	2,347	—	—	—	—	—
Hett	2	1	3	,,	300	—	—	—	—	—
Tudhoe	2	2	4	,,	1,046	—	—	—	—	—
Red Vein	56	8	64	Iron ore	11,616	—	—	—	—	—
Level Gate	16	2	18	,,	2,932	—	—	—	—	—
West Slitt	10	6	16	,,	1,177	—	—	—	—	—
North Grove Rake	—	—	—		—	—	—	—	—	—
Rowan Tree, A.	13	1	14	,,	3,377	—	—	—	—	—
Foulwood	4	—	4	,,	102	—	—	—	—	—
Total for county of Durham	1,584	834	2,418	——	34,858	—	—	1,413	—	—
Northumberland.										
W.B. Mines	111	20	131	Lead ore	165	—	—	197	—	—
Derwent Mining Co., Shildon	—	—	—	,,	—	—	—	—	—	—
Total	111	20	131	——	165	—	—	197	—	—
Cumberland.										
Teesside	4	—	4	Lead ore	—	—	—	—	—	—
Westmoreland.										
Greenside Mining Co.	114	103	217	Lead ore	1,581	—	—	—	—	—
London Lead Co.	4	—	4	,,	—	—	—	—	—	—
Hartley Birkett	2	—	2	,,	—	—	—	—	—	—
Clouds	—	—	—	,,	—	—	—	—	—	—
Nether Heath	—	—	—	,,	—	—	—	—	—	—
Eden Valley Mining Co.	—	—	—	,,	—	—	—	—	—	—
Longrigg	—	—	—	Iron ore	—	—	—	—	—	—
Ditto do.	—	—	—	,,	—	—	—	—	—	—
Fairfield	—	—	—	,,	—	—	—	—	—	—
Providence	—	—	—	,,	—	—	—	—	—	—
Elterwater Green Slate Co.	54	27	81	Slate	1,606	—	—	—	—	—
Do. Thrang Crag	—	—	—	,,	—	—	—	—	—	—
Do.	—	—	—	Building stone.	60	—	—	—	—	—
Kentmere Slate Co.	—	10	10	Slate	229	—	—	—	—	—
Banks do.	10	4	14	,,	286	—	—	—	—	—
Cawdle do.	2	1	3	,,	5	—	—	—	—	—
Scot Copy do.	4	3	7	,,	67	—	—	—	—	—
Total for Westmoreland	190	148	338	——	3,834	—	—	—	—	—
Yorkshire, North Riding.										
London Lead Co.	22	16	38	Lead ore	145	—	—	—	—	—
Arkendale Mining Co.	210	50	260	,,	1,968	—	—	—	—	—
Old Gang do.	156	63	219	,,	798	—	—	—	—	—
Hurst do.	53	25	78	,,	242	—	—	—	—	—
Keld Heads do.	74	20	94	,,	191	—	—	—	—	—
Surrender, *A* do.	6	—	6	,,	28	—	—	—	—	—
Swinnergill, *A* do.	100	36	136	,,	732	—	—	—	—	—
Worton do.	8	2	10	,,	—	—	—	—	—	—
Wet Groves do.	8	—	8	,,	—	—	—	—	—	—
Apedale do.	12	6	18	,,	121	—	—	—	—	—
West Burton do.	21	—	21	,,	—	—	—	—	—	—
Sargill do.	7	—	7	,,	—	—	—	—	—	—
Fell End do.	7	—	7	,,	—	—	—	—	—	—
Merrybent do.	—	—	—	,,	—	—	—	—	—	—
Beldi Hill	6	1	7	,,	—	—	—	—	—	—
Ellerton Moor	—	—	—	,,	—	—	—	—	—	—
Grinton Moor	—	—	—	,,	—	—	—	—	—	—
Summer Lodge	—	—	—	,,	—	—	—	—	—	—
Whitaside	—	—	—	,,	—	—	—	—	—	—
Egton	9	12	21	Whinstone	6,726	—	—	—	—	—
Grosmont	8	2	10	,,	5,876	—	—	—	—	—

—	Persons Employed.			Kind of Mineral.	Mineral Dressed.			Undressed Mineral sold, treated, or used.		
	Underground.	Above Ground.	Total.		Tons.	Cwts.	Qrs.	Tons.	Cwts.	Qrs.
Butersett	15	6	21	Flags	800	—	—	2,200	—	—
Seavey	7	6	13	„	600	—	—	—	—	—
Whaw	2	—	2	„	40	—	—	5	—	—
Cragg End	3	1	4	„	6,000	—	—	—	—	—
Gayles	2	4	6	„	200	—	—	—	—	—
Do.	—	—	—	Walling stone.	100	—	—	—	—	—
Temple Scar	3	—	3	Flags	200	—	—	—	—	—
Pen Hill	3	1	4	„	400	—	—	—	—	—
Pen Hill Park	7	2	9	„	400	—	—	—	—	—
Total for North Riding of Yorkshire	749	253	1,002	—	25,567	—	—	2,205	—	—

The following table gives the falling off in the produce of every description of mineral, and persons employed in and about the mines in this district, as compared with the previous year; this falling off is accounted for by the continued depression in the coal and iron trades, viz.:—

A decrease in the produce of coal of	-	935,506 tons.
Do. fire-clay	-	69,964 „
Do. ironstone	-	973,268 „
Do. metalliferous	-	16,622 „
Total	-	1,995,360 „

and a decrease in the number of persons employed of 5,456, the falling off for the whole kingdom being 3,048,122 tons of mineral, and 19,057 persons employed; these figures show that the great depression of trade has fallen more severely on this than on any of the other districts, it bearing a loss of 65½ per cent. of the decrease in the mineral produce, also 28⅔ per cent. of the less number of persons employed.

The whole of the mines in the district have been working short time, and I find there are now—

81 coal pits.
20 ironstone mines.
37 metalliferous mines.

138 total pits and mines.

standing idle altogether.

The output of mineral at the coal mines during the past year has been 356 tons per person employed, as against 352 tons for the previous year; and for the Cleveland ironstone mines it was 784 tons per person employed, as against 735 tons for the previous year.

The total number of deaths caused by accidents in the coal mines during the year 1878 was 83, or 12 less than in 1877; those occurring in the Cleveland ironstone district number 17, or 4 less than in the previous year, while in the metalliferous mines there have been 5 lives lost, this being an increase of 1 death over the year 1877.

The number of persons employed per life lost in the coal mines during the past year has been 638, as against 595 in the previous year, and produce of 227,002 tons per life lost, as against 208,944 tons the previous year; and in the ironstone mines of Cleveland there have been 399 persons employed per life lost, as against 408 the previous year, and 313,392 tons of mineral raised per life lost, against 299,896 tons for the year 1877, showing a slightly better result; while the metalliferous mines number one death to every 779 persons for 1878, against one death to every 1,008 persons employed during the preceding year.

In addition to the list of fatal accidents already enumerated in the accompanying schedule, I have received notices during the year of 515 non-fatal accidents causing personal injuries to 551 persons, as follows: in coal mines 402, in ironstone mines 101, and in metalliferous mines 12. The above accidents consist of 9 explosions of fire-damp, 231 falls of roof or side, 16 in shafts, 218 from miscellaneous causes underground, and 41 on the surface. By far the largest proportion of both fatal and non-fatal accidents that take place in mines are

from two sources, viz., falls of roof or side, and by trams or tubs. Last year the non-fatal accidents amounted to 44½ per cent. and 23½ per cent. respectively of the whole number reported throughout the entire district from the above causes. The nine non-fatal gas explosions took place in the following order, viz., on the 22nd February at Ushaw Moor Colliery injuring one man; on the 1st April at Ferry Hill Colliery, injuring one man; on the 6th April at Boosbeck Ironstone Mine, injuring one man; on the 6th May at the Tudhoe Whinstone Mine, injuring one man; on the 27th May at Elvet Colliery, injuring one man; on the 8th June at Broomside Colliery, injuring one man; on the 10th June at Skelton Park Ironstone Mine, injuring five men; on the 6th July at Holmside Colliery (in a sinking pit), injuring four men; and on the 24th July at Pittington Colliery, also injuring one man.

I have further received, in addition to the list of fatal accidents already alluded to, notices of eight deaths having taken place in and about the mines which cannot be classed among the mining accidents, viz.:—On the 22nd February, George Bradfield, a waggon rider, aged 18 years, was run over and killed on the branch railway at North Hetton Colliery. On the 28th February, John Heslick, a wasteman, aged 45, received a sprain, and died some time after from inflammation, not the effects of an accident, at East Hetton Colliery. On the 1st June, Thomas Gowland, a platelayer, aged 66 years, was thrown from a set of waggons which had run amain on the branch railway and was killed, at Bowden Close Colliery. On the 26th June, Thomas Stones, a shiftman, aged 51 years, died in the pit, supposed from natural causes, while in the act of cutting a prop, at Shildon Lodge Colliery. On the 28th August, John Kirk, a schoolboy, aged 8 years, strayed on the railway near to a coal depôt, and was run over and killed by a locomotive and set of waggons, at Ryhope Colliery. Patrick Burns, another boy, aged 6 years, was also severely injured at the same time. On the 11th October, John Gilliland, a collier, aged 42 years, is supposed to have died from natural causes while returning from his work at Rainton Colliery: this case was not reported. On the 27th November, Robert Hartley, a shiftman, aged 69 years, died from natural causes in the Seaham Colliery; and on the 26th December, Matthew Costello, a waggon rider, aged 19 years, fell before a coal waggon, was run over and killed while taking it into the fire-hole at the railway engine on the line at Burnhope Colliery.

The following accidents appear to require some further explanation and comment than what has been already given in the accompanying schedule.

Explosions of Gas.

There have been three fatal explosions of gas in this district during the year under notice, causing the deaths of four persons. No. 21 on the list took place on the 25th March at Wheatley Hill Colliery, causing the deaths of Joseph Walker, a deputy, and Alfred Grimwood, a collier, while working in the main coal seam. The accompanying plan shows the position of workings where the explosion took place, the parts shaded black are goaf, where the coal has all been removed and the roof fallen in; the dotted part is fallen working boards and walls, connecting the two pieces of goaf; A is the place where the two deceased were working, and where the explosion took place, the air being conducted round as shown by the arrows. On the morning of the accident Grimwood was engaged driving what is termed a "lift" of coal, about 4 yards wide, over from the goaf westward, and alongside the fallen wall to the north. Gunpowder being unfortunately allowed to be used in these broken workings, he prepared three shots, and Walker, whose duty it was to fire them, had lighted two, if not all the three; however, two seem to have gone off, immediately followed by an explosion: although it was slight, it was sufficient to inflict such injuries on the two men as to shortly after cause their deaths.

There seems to have been a good deal of laxity in the management, as was shown at the inquest: several of the witnesses spoke to having seen gas in the workings, and of places having to be stopped in consequence, also of the practice of lighting up two shots at a time; one deputy spoke to having seen gas on the fall or goaf at A, when he drew the jud out a week before; he further expressed an opinion that after having seen gas on the falls it was still safe to fire shots. A most singular admission was made by the overman in charge of the pit, who stated that the east side of this district close to where the explosion took place was reported to him on the 18th March by the deputy while still in the pit as being laid off in consequence of the presence of gas, but instead of going to see it himself, as required by the special rules, he sent the back-overman to do so, then went home and made a report in his book that he had examined the main coal and found all right. There were no reports made either by the overmen or deputies when gas was found in the workings, or yet was there any report made, as required by the 6th General Rule, of the withdrawal of workmen in case of sudden danger, and, strange to say, no report of the presence of gas on the goaf edges or the stoppage of the workings from the same cause

PLAN OF WORKINGS

IN THE

MAIN COAL SEAM

WHEATLEY HILL COLLIERY.

Where the Explosion took place.

On the 25th March 1878.

Scale 2 Chains per Inch.

Thomas Ull.

H.M. Inspector of Mines.

Dangerfield. Lith. 22. Bedford St. Covent Garden.

had ever been made to the manager by the overman, and which official appeared to have been totally ignorant of it until that morning.

This seam is well known to give off a good deal of gas, and a fatal explosion took place in the adjoining district only two years ago, when four lives were lost. Since that accident I have endeavoured to discourage the use of powder both in long walls and broken or pillar working as much as possible, it being in my opinion a very dangerous practice.

No. 24 on the list took place at St. Helen's Colliery on the 8th April, when one man lost his life. Deceased was a shiftman, and was sent into a place to lead out some water, using a naked light; he had, however, gone further than he was ordered to go, and a little gas having accumulated it exploded at his candle, burning him in such a manner as to cause his death about a fortnight after. Although there has never been much gas seen in this pit, I consider safety lamps ought to have been used on this occasion, as they were working between two large goaves, also between two fault slips, and the air had to pass along the goaf side to ventilate the place where the accident occurred.

No. 25 on the list took place on the same day in the underground stables at Westerton Colliery, burning a boy to such an extent that he died 10 days after. It would appear some gas had accumulated in an old board behind the stables, and made its way through a hole in the stopping into the stable, where the boy had gone for some purpose or other, when it fired at his candle.

Falls in the Mine.

The fatal accidents that have taken place in the coal mines from the above cause for the past year are 37, being the same as during the preceding year; and in the ironstone mines there have been 7, as against 10 the previous year. Considering the great falling off in the production of mineral and number of persons employed, this cannot be regarded as a satisfactory result, and I can only repeat what I stated in last year's report, that the great loss of life from this cause demands a more frequent examination of the roof by competent men, keeping the props close up to the face, a more frequent use of planks or crown-trees, and rigidly enforcing of the special rule as to the use of short props or sprags while the men are kirving. Accidents might be considerably reduced in the Cleveland ironstone mines by preventing the miners entering the place after shot firing until the powder smoke has cleared away; several lives have been lost by men commencing to break up the stone before the place had cleared so as to enable them to make a more perfect examination of the roof and sides, and so have it either propped or stays put in.

Shaft Accidents.

There have been 7 fatal shaft accidents during the year in connexion with the coal mines, as against 12 the previous year, and it will be observed there has not been a fatal accident from this cause in Cleveland for the last three years. The accidents for the present year have all been of an ordinary character of shaft accident, and none of them require any special remark in this report.

Miscellaneous Accidents Underground.

This class of accident is again above the average, and is chiefly due to accidents to those employed on engine and inclined planes, and to horse drivers and putters by trams or tubs. This list also includes four deaths caused by the explosion of an underground boiler at Thornley Colliery. The accidents on engine and incline planes appear to be on the increase, and will, I fear, not be reduced, on account of the additional machinery now being introduced into the mines, which no doubt causes greater risk to those whose duty it is to travel or are employed on such planes. The ages of the persons killed on planes in coal mines were 64, 59, 47, 17, 14, 14, 14 years respectively, and in the ironstone mines their ages were 63, 50, 35 years respectively. The accidents arising from crushes by or from being run over by trams or tubs are again a serious item, and require carefully looking after by those in charge of mines. The deaths during the past year have all occurred to horse drivers on the main roads and putters who bring the tubs from the face of the workings to the flats, their ages being, in coal mines, 17, 16, 14, 14, 13, 13, 13 years respectively, and in ironstone mines 19, 14 years respectively.

Accidents on Surface.

The accidents on surface amount to 10 at coal mines, and one at the ironstone mines; they are below the average of previous years, and are chiefly caused by being crushed between waggons and about the screens.

The fatalities in mines in this district have increased considerably during the last two or three years without any apparent cause, and, observing this, I have made it my duty to attend more inquests than I probably might have done under other circumstances, with a view to satisfy myself that every reasonable care had been taken to prevent accidents by strictly carrying out the provisions of the Act and special rules, and offering such remarks and advice to managers as the circumstances of the case seemed to justify. I have also been careful to inquire into the number of deputies employed to look after the safety of the men in each district. I have met with a few cases which I thought required remark, but none of carelessness or neglect sufficient to warrant me in reporting it to you with a view to a prosecution; the managers generally seem willing to adopt suggestions calculated to prevent accidents.

The great depression in the coal and iron trades has no doubt compelled colliery owners to introduce certain economies in the cost of working their mines, but I do not find this practised to such an extent as to endanger the lives or limbs of their employés, or to interfere with the discipline and management of such mines. I feel myself bound, although reluctantly, to express my conviction that a very large proportion of the accidents caused by falls of roof are too frequently due to the colliers themselves, not perhaps wilfully, but from a desire to get as much coal, &c. as they possibly can during the short time they are now allowed to work, which too frequently leads them to neglect their own safety. The putters and drivers are affected in the same direction, as they must put or drive an additional number of tubs or sets in the shortened hours, so as to meet the reduced wages. There appears to me to be far too much bustle and hurry going on in the mines, so as to press as much work as possible into the least time, and which frequently leads to accidents.

Accidents in Metalliferous Mines.

There have been five fatal accidents in the above mines during the year: one was caused by a shot going off before the miner got clear of it, it is supposed there had been some loose powder lying near the match he was lighting; the other four were caused by falls of ground, and there did not appear to be any neglect on the part of the responsible persons.

Boiler Explosion.

Accident No. 7 on the list was caused by the explosion of No. 1 underground boiler in the Low Main Seam at Thornley Colliery on the 18th January, resulting in the deaths of four men and serious personal injury to 10 others. At the inquest the coroner, Mr. Crofton Maynard, secured the services of Mr. Waller, an engineer of considerable experience, who made a report and prepared a plan of the exploded boiler, both of which are hereto appended, the red lines on the plan showing the direction of the torn plates which were situated above the fire, the plates coloured yellow had just recently been put in. At your request, Major-General Hutchinson also attended the inquest, acting as assessor to the coroner. The ordinary working pressure of the boiler was 35 lbs. per square inch, and with a view to ascertain the actual condition of the plates, those marked A, B, and C on the plan, which were all plates actually torn by the explosion, and D, being a top plate, were tested to breaking at the River Wear Commissioners Chain and Anchor Test Works at Sunderland, the results being as follows:—

Mark of Plate, and Direction of Test.	Breaking Strain per square inch.	Elongation as measured.	Deflection as measured.
	Tons.	Inches.	Inches.
A, with the fibre	26	$\frac{1}{4}$	$\frac{1}{16}$
„ across „	22	$\frac{5}{32}$	$\frac{1}{32}$
B, with the fibre	24	$\frac{1}{8}$	$\frac{1}{64}$
„ across „	18	$\frac{1}{32}$	—
C, with the fibre	$22\frac{3}{4}$	$\frac{7}{32}$	$\frac{1}{16}$
„ across „	17	$\frac{1}{32}$	—
D, with the fibre, a top plate	22	$\frac{3}{32}$	$\frac{1}{64}$
„ across „ „	18	$\frac{1}{32}$	—

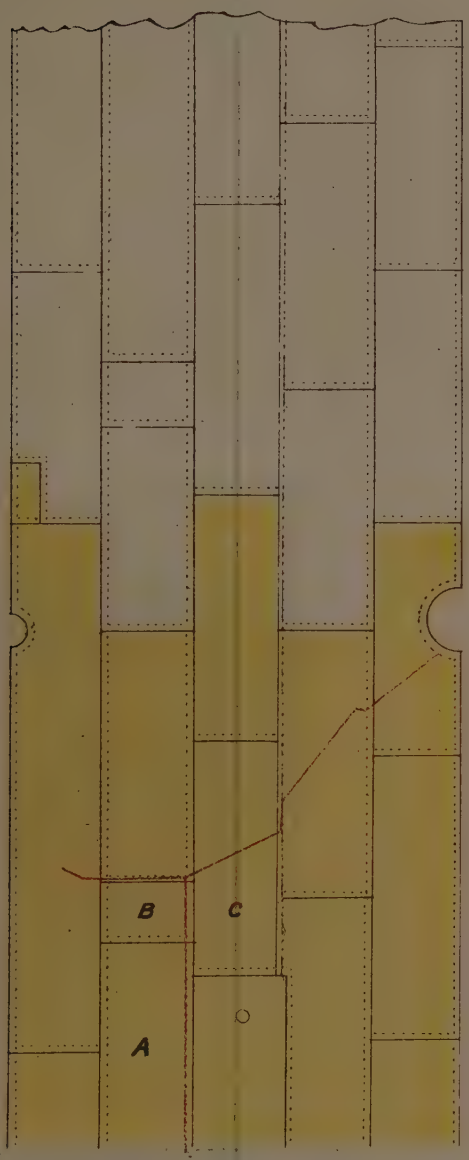
The average strength of good boiler plates may be taken at $22\frac{1}{2}$ tons per square inch; the average strength of the eight samples tested amounts to $21\frac{1}{4}$ tons per square inch. Taking the lowest figure of 17 tons per square inch given by the plate C, a calculation shows that the

PLAN OF PART OF No. 1 BOILER.

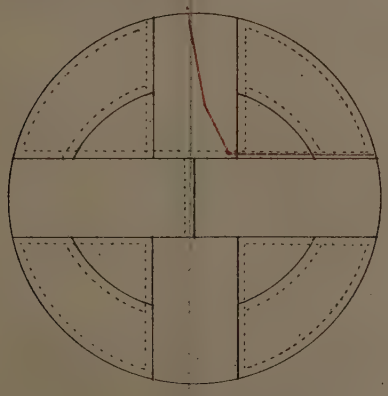
LOW MAIN SEAM, THORNLEY COLLIERY.

Which Exploded on the 18th January 1878.

Scale ¼ Inch to One Foot.



FRONT END BOTTOM.



Thomas Hall

H. M. Inspector of Mines

DANGERFIELD, LITH. 22, BEDFORD ST. COVENT GARDEN.

internal pressure required to burst the boiler at a longitudinal line of rivets would be 253 lbs. per square inch, or $7\frac{1}{4}$ times the ordinary working pressure of this boiler; this is on the presumption that the plates maintained their original thickness of $\frac{3}{8}$ of an inch, and as a matter of fact they had not appreciably diminished from this.

I quite agree with Mr. Waller that the explosion was caused by want of water; indeed, everything elicited at the inquest tended to show that the man in charge of the boiler, and who was one of the victims to the explosion, had neglected the feed, and purposely kept the water in the boiler low, in order to ease his labours in firing.

After an inquiry extending over two days, the jury returned the following verdict, viz.:— "From the evidence brought before us we have arrived at the conclusion that the boiler has "exploded in consequence of proper care and attention not having been exercised on the "part of William Duffy, the fireman in charge, he having neglected or not attended to the "proper feeding of the boiler with water, and that he allowed the water to get so low in the "boiler as to cause the plates to be heated to such an extent as in our opinion to cause the "explosion." The jury added a recommendation to their verdict to the following effect: "that "in future sludge cocks should be fixed on the boilers in such a position that, by proper "attention, they will take as much sediment out of the boiler as possible;" also, "that a "better ventilation be carried over the top of the boiler."

Mr. Waller's Report.

"Thornley Colliery, 18th January 1878.

"The boiler is said to have been originally built in Newcastle, in 1857, as a one tube Cornish internally fired, and to have been altered about 12 years ago, lengthened 11 feet 6 inches in the barrel, egg ends put in, and placed in its present position.

"As a Cornish boiler it would be seated with the edge of the plate on the outside of the shell directed to the front end, but when altered and seated with the flash flue the edges of the plates would be turned towards the back end, as the boiler is now found to be. The repairs done at the front end appear to be plates or parts of plates secured to the old rivet holes, except at the front plate of the bottom row, where new holes have been put into the plate on the right hand side of it for greater security. It is advisable in all cases of repair to substitute new holes for the old, lest they should have become strained in use or repair. The new work in lengthening the boiler appears to have been put in at the front end, and the effects of the explosion are confined to this extension. The boiler at the time of the explosion was plain, cylindrical, egg ended, externally fired, about 47 feet long and 5 feet 3 inches in diameter, the circumference being formed of eight lengths of plates about $\frac{3}{8}$ of an inch in thickness, five being 1 foot 11 inches in width (between centres of rivets), and the other three 2 feet 6 inches wide.

"The mountings on the boiler, in their order from the front, were:—

"Steam jug; manhole; dead flange; lever float; steam jug, with connexion to the other boiler; lever float; dead flange; safety valve; patent whistle; dead flange; feed jug, with self-acting kep-valve and wheel stops; safety valve and manhole.

"There was no sludge or blow-off cock on this boiler for removing any dirt that might accumulate while at work, but with this exception, the boiler was amply mounted. It had two floats to show the water level, and a patent whistle to give an alarm in case of the water becoming low. There were two 4-inch safety valves with levers and weights adjusted to about 33 lbs. per square inch at the end of the lever, a pressure far within the limit of safety if the boiler had been in proper condition. The whole of the fittings when examined were found free and in good working order. The feed pipe showed a clean waterway. In the feed jug the self-acting valve should prevent the water from returning and passing into the other boiler. The wheel stop valve was found to be closed. The water for supplying the boilers was taken from a sand feeder at about 20 fathoms below the surface, was of a fair quality, and would reach the boiler under a pressure more than three times that of the steam, so that the water level would be easily maintained towards the back of the inside of the boiler. There was scurf on the plates nearly $\frac{1}{8}$ of an inch thick, which had not been removed by the explosion. The appearance of the scale, where not knocked off or damaged by those who have been in the boiler before the examination, was carefully noticed. That of the front end showed signs of overheating, and at the right-hand side, about the middle of the boiler in height, there were several marks indicating that the water had been down to the level of these lines.

"The lowest mark remaining being 14 inches above the bottom, the others, at about $\frac{1}{2}$ to $\frac{3}{4}$ of an inch above each other, showing a regular decrease from time to time of the water in the boiler. On examination of the plates since the explosion, they are found to bear very nearly

their original thickness, and the slight corrosion inside does not affect the question as to the cause of the explosion. The contents of the boiler were discharged by means of a plug in the first plate of the bottom row of plates over the fire, and the boiler appears to have been seated nearly level. The explosion appears to have originated in the seam on the left-hand side of the bottom row, and in what are said to be repair plates at or near the back of the second plate, which is 15 inches long, of the row to the left hand of the bottom, passing along the back seam and into the plate of the adjoining row. The rent in the seam to the left hand of the bottom row comes to the front end and across the front egg-end, separating fully one-fourth, which is left attached to the shell at the other side of the opening.

"From the point at which the seams already indicated meet, the rent passes diagonally across the bottom strip, and the first and second to the right hand of it, into a circular patch about the middle of the boiler in height. The boiler was lifted at the front end, striking the top of the arch in which it is placed, and then falling back into almost its original position, but slightly turned over on its right side. From the small damage done to the boiler we may conclude that there was very little resistance offered by the shell plates to the bursting pressure, and that such bursting pressure did not exceed 33 lbs. per square inch, at which the safety valves would relieve the boiler, and that therefore the plate must have become deteriorated either by overheating or other cause. From the fractures of the plates, the burnt scales, and the lines or marks previously referred to, I have no doubt that the boiler was short of water. I cannot find that there was any pump connected with the feed pipe of this boiler, but that it was in direct communication by means of the stop wheel on the feed jug and a tap in a pipe of about $2\frac{1}{2}$ inches in diameter, leading from the sand feeder under considerable pressure, by which a direct communication could be opened at any moment.

East Hetton Colliery Arbitration Case.

This case arose out of a dispute, or difference of opinion, between Mr. W. O. Wood, the principal viewer or manager of the above colliery, and myself as to the practice of using gunpowder for blasting in the long wall working in the Harvey seam. The pit is about 135 fathoms in depth from the surface, and the seam of coal is from 3 feet 6 inches to 3 feet 9 inches in thickness clean coal, below which is a seam of coarse seggar clay varying from 6 inches to 18 inches in thickness, and below this there is a thin seam of coal 5 inches in thickness. The roof consists of blue metal with post girdles. The system of working adopted was the Derbyshire mode of long wall working, that is, taking all the coal out in "faces" varying in length from 200 to 500 yards, and making gates or pack roads through the goaf at suitable distances for the purpose of bringing out the coals or for ventilation. This seam gives off a considerable quantity of gas, a portion of which will naturally find its way into the goaf and be lodged there, and as shot firing was freely practised along the long wall faces I had grave doubts as to the policy of continuing the practice in such close proximity to a goaf, and on several occasions, extending over near three years, I drew Mr. Wood's attention to what I considered to be a dangerous practice and urged him to give it up, but without success. Seeing that I had no judicial remedy under the Mines Regulation Act, and feeling that I was incurring too great a responsibility, I had no alternative but to avail myself of the provisions of the 46th section of the above Act, and by your permission I served the owners of the colliery with the notice embodied in the agreement and award hereto appended; to which Mr. W. O. Wood, the manager of the colliery, replied on behalf of the company as follows :—

"Harvey Seam Longwall Workings.

"East Hetton Colliery, Coxhoe, Co. Durham,
"Sir, 13th February 1878.

"On January 30th I received from the Inspector of Mines, Mr. Thomas Bell, the formal notice under section 46, giving notice of danger in the use of gunpowder in these long walls, and requiring it to be discontinued."

"I now formally 'object to remedy the matter complained' of. I have to-day given notice to Mr. Bell of the appointment of our arbitrator, Mr. W. H. Wood, of West Hetton Lodge, Coxhoe, mining engineer, and now beg to give notice of the same to you, as required by the Act."

"The date of the reference will be, I assume, 14th February."

"I am, Sir, your very obedient Servant,"

"The Right Honourable the Secretary of State, "(Signed) Wm. O. Wood."
"Whitehall, S.W."

Mr. W. H. Wood, mining engineer, of West Hetton, having been nominated as arbitrator on behalf of the colliery company, and you having nominated Mr. Jacob Higson, mining engineer, of Stockport, to act on behalf of the Government, both gentlemen accepted the appoint-

ment and fixed a meeting at the colliery for the 8th March, when the following agreement to refer the matter in dispute to arbitration was made; at the same time they appointed Mr. A. L. Steavenson, mining engineer, of Holywell Hall, Durham, as umpire.

"MEMORANDUM OF AGREEMENT, made the eighth day of March one thousand eight hundred and seventy-eight, between WILLIAM OUTTERSON WOOD, of East Hetton Colliery, in the County of Durham, for himself as Agent and Manager, and on behalf of the Owners or Proprietors of a certain Colliery called the East Hetton Coal Company of the one part, and THOMAS BELL, of the City of Durham, Her Majesty's Government Inspector of Mines for the South Durham District, on behalf of Her Majesty's Secretary of State, of the other part."

"WHEREAS under and by virtue of the Coal Mines Regulation Act, 1872, section 45, it is enacted and provided that the said Inspector shall have power to enter, inspect, and examine any colliery to which the said Act applies, and every part thereof, and all matters and things connected with or relating to the safety of the persons employed in or about the said mine:"

"And whereas the said Thomas Bell, as such Inspector as aforesaid, has examined or caused to be examined the workings of the said East Hetton Colliery or the plans thereof, and in the course of such examination has discovered that the said owners or their agent, the said William Outterson Wood has permitted or caused to be used certain gunpowder for blasting purposes in the long walls of a certain seam called the 'Harvey Seam' which he the said Thomas Bell considers dangerous or threatens or tends to the bodily injury of the workmen so engaged in the said seam."

"And whereas the said Thomas Bell, as such Inspector as aforesaid, has made a complaint in writing, and given notice to the said East Helton Coal Company or their agent that the practice of using gunpowder for blasting in the working of the long walls in the said 'Harvey Seam' is dangerous, and in his opinion threatens or tends to the bodily injury of the persons employed therein, and which notice is in the words and figures following, that is to say:—"

"Coal Mines Regulation Act, 1872."

"GENTLEMEN," "Durham, 29th January 1878."

"IN pursuance of section 46 of the above-mentioned Act, I hereby give you notice that I find the practice of using gunpowder for blasting purposes in the long walls of the Harvey Seam of East Hetton Colliery to be dangerous, so as, in my opinion, to threaten or tend to the bodily injury of the persons employed therein. The particulars in which I consider such practice in the Harvey Seam of the said colliery to be dangerous are as follows:—The Harvey Seam gives off a considerable quantity of fire-damp, and the goafs being the natural receptacle for such gas, much of it will necessarily be lodged there. Any sudden diminution of atmospheric pressure or sudden falling or weighting of the goafs may easily force a quantity of gas out into the face at the moment of shot-firing, this being the more dangerous, as the coal is worked to the rise of the seam or measures. Under the circumstances a blown-out shot would fly back with considerable force into the goaf, and might reach and explode gas which could not be discovered by the fireman or deputy. And the concussion caused by a blown-out shot would have the effect of forcing gas out of the goafs into the pack roads or other parts of the long wall roads or face, and following the course of the ventilation might easily come in contact with the lights of other shot-firers and there be ignited. And I hereby require you to remedy the said matter by discontinuing the practice of using gunpowder as aforesaid in the Harvey Seam of the said colliery."

"I am, Gentlemen, your obedient Servant,"

"THOMAS BELL,"

"Her Majesty's Inspector of Mines."

"And whereas the said William Outterson Wood, on behalf of himself and the said East Hetton Coal Company, his employers, denies that the use of the said gunpowder in the said long walls of the said Harvey Seam is dangerous, or threatens or tends to the bodily injury of the workmen employed therein, but which allegation he the said Thomas Bell, as such Inspector of Mines as aforesaid, does not admit."

"And whereas the said William Outterson Wood has, on behalf of himself and the said East Hetton Coal Company, consented and agreed, in the terms of the Mines Regulation Act, 1872, to submit the question that is in dispute between the parties hereto of the first and second parts to the final arbitrament and determination of William Henry Wood, of West Hetton Lodge, in the county of Durham, mining engineer, and Jacob Higson, of Stockport, in the county of Chester, mining engineer, and to such umpire as the said arbitrators shall appoint before proceeding to the arbitration, so that the said arbitration may proceed in all respects under and by virtue of the provisions of the 49th section of the Mines Regulation Act, 1872."

"As witness the hands of the said parties."

"WILLIAM O. WOOD."

"Witness to the signing hereof by the said" "THOMAS BELL."

"William Outterson Wood and Thomas Bell,"

"WILLIAM BRIGNAL, Solicitor, Durham."

"We, the undersigned arbitrators above named, by virtue of the power and authority within named, and before we proceed to the arbitration of the matters in dispute, have hereby appointed Addison Langhorn Steavenson, of Holywell Hall, in the county of Durham, mining engineer, as umpire."

"Dated this 8th day of March 1878."

"JACOB HIGSON."

"Witness, "WILLIAM BRIGNAL." "WM. HY. WOOD."

"We, the undersigned arbitrators, hereby extend the time for making our award until the 8th day of June 1878."

"As witness." "JACOB HIGSON."

"WM. BRIGNAL." "WM. H. WOOD."

An examination of the mine was then made and a formal adjournment agreed upon to the 24th April at the County Hotel, Durham, on which day the arbitrators and umpire met and examined witnesses, and again on the 6th May, when the case was closed and left in the hands of the two arbitrators, who, however, failed to come to an agreement; the whole case was then referred to the umpire, and he, after having taken time to consider, made the following award :—

"To all to whom these Presents shall come, greeting :—"

"WHEREAS by memorandum of agreement bearing date the eighth day of March one thousand eight hundred and seventy-eight, and made between William Outterson Wood, of East Hetton Colliery, for himself as agent and manager, and on behalf of the owners or proprietors of a certain colliery called the East Hetton Coal Company, of the one part, and Thomas Bell, of the city of Durham, Her Majesty's Inspector of Mines for the South Durham district, on behalf of Her Majesty's Secretary of State, of the other part: "

"Whereas under and by virtue of the Coal Mines Regulation Act, 1872, section 45, it is enacted and provided that the said Inspector shall have power to enter, inspect, and examine any colliery to which the said Act applies, and every part thereof, and all matters and things connected with or relating to the safety of the persons employed in or about the said mine :"

"And whereas the said Thomas Bell, as such Inspector as aforesaid, has examined or caused to be examined the workings of the said East Hetton Colliery or the plans thereof, and in the course of such examination has discovered that the said owners or their agent, the said William Outterson Wood, has permitted or caused to be used certain gunpowder for blasting purposes in the long walls of a certain seam called the 'Harvey Seam' which he the said Thomas Bell considers dangerous or threatens or tends to the bodily injury of the workmen so engaged in the said seam :"

"And whereas the said Thomas Bell, as such Inspector as aforesaid, has made a complaint in writing and given notice to the said East Hetton Coal Company or their agent that the practice of using gunpowder for blasting in the working of the long walls of the said Harvey Seam is dangerous, and in his opinion tends to the bodily injury of the workmen employed therein, and which notice is in the words and figures following, that is to say :— "

"Coal Mines Regulation Act, 1872."

"GENTLEMEN," "Durham, 29th January 1878."

"IN pursuance of section 46 of the above-mentioned Act, I hereby give you notice that I find the practice of using gunpowder for blasting purposes in the long walls of the Harvey Seam of the East Hetton Colliery to be dangerous, so as, in my opinion, to threaten or tend to the bodily injury of the persons employed therein. The particulars in which I consider such practice in the Harvey Seam of the said colliery to be dangerous are as follows :—The Harvey Seam gives off a considerable quantity of fire-damp and the goafs being the natural receptacle for such gas, much of it will necessarily be lodged there. Any sudden diminution of atmospheric pressure or sudden falling or weighting of the goafs may easily force a quantity of gas into the face at the moment of shot-firing, this being the more dangerous as the coal is worked to the rise of the seam or measures. Under the circumstances a blown-out shot would fly back with considerable force into the goaf and might reach and explode gas which could not be discovered by the fireman or deputy. And the concussion caused by a blown-out shot would have the effect of forcing gas out of the goafs into the pack roads or other parts of the long wall roads or face, and following the course of the ventilation might easily come in contact with the lights of other shot-firers and there be ignited. And I hereby require you to remedy the said matter by discontinuing the practice of using gunpowder as aforesaid in the Harvey Seam of the said colliery."

"I am, Gentlemen, your obedient Servant,"

"THOMAS BELL,"

"Her Majesty's Inspector of Mines."

"And whereas the said William Outterson Wood, on behalf of himself and the East Hetton Coal Company, his employers, denies that the use of the said gunpowder in the said long walls of the said Harvey Seam is dangerous or threatens or tends to the bodily injury of the workmen employed therein, but which allegation he the said Thomas Bell, as such Inspector of Mines as aforesaid, does not admit : "

"And whereas the said William Outterson Wood has, on behalf of himself and the said East Hetton Coal Company, consented andagreed, in the terms of the Mines Regulation Act, 1872, to s bmit the question that is in dispute between the parties hereto of the first and second parts to the final arbitrament and determination of William Henry Wood, of West Hetton Lodge, in the county of Durham, mining engineer, and Jacob Higson, of Stockport, in the county of Chester, mining engineer, and to such umpire as the said arbitrators shall appoint before proceeding to the arbitration, so that the said arbitration may proceed in all respects under and by virtue of the provisions of the 49th section of the Mines Regulation Act, 1872: "

"And whereas the said arbitrators, before proceeding upon the arbitration, did, by writing under their hands bearing date the eighth day of March one thousand eight hundred and seventy-eight, endorsed on the said agreement of reference, appoint me, Addison Langhorn Steavenson, of Holywell Hall, in the county of Durham, mining engineer, to be umpire according to the provisions contained in the said agreement:"

"And whereas the said arbitrators, by a writing bearing date the eighth day of March one thousand eight hundred and seventy-eight, endorsed upon the said agreement, extended the time for making their award until the eighth day of June one thousand eight hundred and seventy-eight:"

"And whereas the said Jacob Higson and William Henry Wood did not make any award concerning the matters referred, but have left the same to be decided by me:"

"Now I the said Addison Langhorn Steavenson, having taken upon myself the charge of this reference, and having heard, examined, and considered the allegations, witnesses, and evidence of both the said parties concerning the premises, and having personally examined the workings of the said East Hetton Colliery, do make this my award and umpirage in writing of and concerning the premises in manner following, that is to say:— "

"I award and adjudge that the practice of using gunpowder for blasting purposes in the long walls of the Harvey seam of East Hetton Colliery is dangerous so as to threaten or tend to the bodily injury of the persons employed therein."

"And I award, adjudge, and direct that the said East Hetton Coal Company do pay the said Thomas Bell his costs of and incident to the reference and arbitration, and the charges of the arbitrators, and my charges and costs as umpire, and the costs of this award, and that the said East Hetton Coal Company do bear their own costs."

"As witness my hand this twenty-third day of May one thousand eight hundred and seventy-eight."

(Signed) "A. L. STEAVENSON."

"Witness to the signing hereof by the said
Addison Langhorn Steavenson" (Signed) "WILLIAM MARSHALL,"
"Clerk with Messrs. Steavenson and Meek,"
"Solicitors, Darlington."

The colliery company were represented by Mr. Blackwell, barrister-at-law, of Newcastle-upon-Tyne, instructed by Mr. C. E. Barnes, solicitor, of Durham. The Home Office was represented by Mr. William Brignal, solicitor, Durham.

Complaints made by Workmen.

During the past year I have received 16 complaints from the workmen at the different under-mentioned collieries, viz.:

Crook Hall Colliery, January 2nd.—Complaint of workmen that there was no breaksman at engine from 6 o'clock p.m. to 2 o'clock a.m. while men were in the pit, contrary to 18th General Rule. And that there was no banksman or onsetter there while men were going down; that they take their own work tools down with them in the cage, also some men had gone down the pit intoxicated, contrary to special rules.

Ladders have been put into one shaft, and some men go up and down carrying their work tools, to which a strong objection is raised. The manager promised that everything should be at once remedied, and it has since been carried out.

Wingate Grange Colliery, January 26.—Complaint of the workmen:

1st. That the safety lamps were examined and locked by the men and boys in the cabin at bank, and not afterwards examined by the deputies before going in bye. An order was given for deputies to re-examine and lock the lamps at the proper stations.

2nd. That there were no keps at the top and bottom of the Lord Pit. An order was given for the men to use the Lady Pit instead, and a notice posted to the effect that those who chose to use the Lord Pit might do so at their own risk, but to this I objected; if there was any danger the men ought not to be allowed to run into it, or take the responsibility off the owners or managers.

3rd. That they did not think it right for the men to ride in the Beeswing Pit while the Lady Pit was going coal work, and vice versâ (the two pits being comprised in one shaft), without a main brattice being put in from top to bottom. I did not see that there was any danger with the present shaft arrangements, and that there would be no benefit if the proposed alteration was carried out, and therefore could not recommend it.

4th. That the men were not allowed to take more than one day per month to examine the whole of the pits under the 30th General Rule. There seems to have been some misunderstanding between the manager and workmen on this point, and when explained the complaint was withdrawn.

Haswell Colliery, March 30th.—Complaint of workmen that the Five Quarter Seam at this colliery was in a bad condition, and they wished to have it inspected. This would hardly appear to be a bonâ fide complaint from the workmen, but emanated (as it turned out) from a

man who had been discharged for some breach of discipline. The obstructions which he pointed out were of a trivial character and are very difficult to prevent in a seam with such a bad roof as this. The manager promised that every attention should be paid to the airways and gateways that was possible.

Cornsay Colliery, April 8th.—Complaint of the workmen that the system of working the coal had been altered and was now dangerous. Found they were driving the boards 10 yards wide in Five Quarter Seam and 12 yards wide in Main Coal Seam; a tramway was laid up each side of the board and supported on the loose side by two rows of props 7 inches diameter, and that the face of the board was supported by three rows of smaller pit props, as there was a wide space in the middle of the board unsupported, I considered it liable to fall and crush out the side props, and so cut off the retreat of the workmen. I suggested that they should support the tramway side with chocks and occasional stone packs or pillars, and use the 7-inch props along the face where the men had to work, and discontinue the use of the small seam props altogether. This suggestion was adopted, also the boards shortened from 60 yards to 30 yards in length.

Brandon Colliery, June 12th.—Complaint of workmen that an overman was frequently going into the pit in a state of intoxication. On investigation I found some foundation for the statement, also that the manager had already dismissed him.

Wheatley Hill Colliery, June 19th.—Complaint of workmen that the master shifter removed a caution board in the Green Hills way in Main Coal Seam 37 yards further in bye from its original position, so as to allow men to work with naked lights, when the board was so removed it was within 31 yards of the goaf, which was full of gas; that the main separation door was unlocked; also that one man had been discharged for complaining to the officials. On an investigation I found that the board had been so removed, but was taken back again, and I could not detect any gas on the goaf; but found the door as stated in the complaint. The manager promised it should not occur again, but denied that the man had been discharged for complaining, and alleged another reason.

Skelton Park Mine, June 15th.—Complaint of workmen that the furnace was damped down from Saturday night to Monday morning. The manager promised to keep the furnace going night and day, also at week ends.

Shildon Colliery, June 24th.—Complaint of workmen (anonymous) that a deputy was examining places with his lamp top off, and that he was otherwise unfit for his position. On investigation I found the manager had already had him punished, and I had a promise that a better arrangement for examining and locking the lamps should be made.

South Skelton Ironstone Mine, July 15th.—Complaint of workmen that there was no onsetter at pit bottom during the night while men were in the mine, and that as soon as the night overman got the shifts changed he locked the signal so as there could be no communication with the surface until his return, except by climbing up the shaft by ladders. On inquiry I found it to be quite correct, and a promise was given that it should be at once remedied.

Haswell Colliery, July 15th.—Complaint of workmen that the Bloomer district, in the Hutton Seam, was full of gas in every working place. On making an examination of the whole of the district on the following day, I found everything in fair working order and not the least trace of gas. A further inspection was made during the same week by the workmen, when a very favourable report was sent to me. On making inquiry I found the complaint emanated from one of the men who had recently been discharged.

Whitworth Colliery, August 20th.—Complaint of the workmen that there was only one deputy in the fore-shift for 40 men, and that they could not get timber into their places. On visiting the colliery, the manager promised to send him assistance, but explained that in this seam the fore-shift man had little to do with setting timber, as the night and back shift men propped all places close up and there was little space cleared until the back-shift men came back again.

Thornley Colliery, August 31st.—Complaint of workmen that the manager had given orders to draw out back timber in longwalls, and broken juds during the day while the men were at work. On a remonstrance being made with the manager as to the danger, also it being contrary to rules, he at once gave orders to discontinue the practice.

Low Beechburn Colliery, October 7th.—Complaint of workmen that powder smoke stood upon them all day, the ventilation was bad, and the furnace was put out on Saturday and not lighted until Monday. The owner promised to stop the badly ventilated places and renew the stoppings and return airways, also to keep the furnace constantly working, and to improve the state of the colliery generally, all of which I believe have been carried out.

Wheatley Hill Colliery, October 12th.—Complaint made by workmen that the airways were blocked in the barrier way in Main Coal Seam, and the west side of flat was full of gas. On an investigation being made the district was found to be in a bad state, even worse than was represented by the men. Steps were at once taken to remove the obstructions, and I thought it my duty to write a letter to the owners of the colliery calling their serious attention to the system of management practised at their colliery.

Thrushwood Colliery, October 17th.—Complaint of two boilers being in bad repair; want of light at bottom of pit; the water lodge being uncovered; and the head stocks being out of order. This pit is not working at present, they are only pumping the water out of the mine. The manager at once laid off the boilers and had them repaired, also had the other matters rectified.

Wheatley Hill Colliery, December 26.—Anonymous complaint from workmen that they had discontinued the use of the keps at pit bottom, and that the cage had often been lowered into the sump, also that the cage had fallen away while men were getting into it at pit bottom. The keps appear to have been discontinued during coal work, but were always used when men or boys were riding, and I had the assurance of the manager that they would continue to do so in future.

Prosecution.

By your authority I instituted proceedings against Mr. Philip Cooper, the head viewer or agent, and Mr. William Hall, the certificated manager, of Thornley Colliery, for a breach of the 24th General Rule of the 51st section of the Coal Mines Regulation Act, 1872, for non-fencing of machinery. The two cases were heard by the Castle Eden bench of magistrates on the 14th of December, when Mr. Cooper was convicted in the penalty of 5*l.* and 7*s.* 6*d.* costs, and Mr. Hall 10*l.* and 7*s.* 6*d.* costs.

Board for Examinations.

The members constituting the board for examinations for managers certificates of competency are:

Messrs. David Dale, Darlington (chairman); H. T. Morton, Biddick Hall; and Lindsay Wood, South Hill, who represent the colliery owners.

Messrs. H. S. Stobart, Witton Tower; J. Marley, Darlington; and A. L. Steavenson, Holywell Hall, who represent the mining engineers.

Messrs. H. Todd, Brandon; G. Parker, Spennymoor; and W. Coulthard, South Church, representing the workmen.

And Mr. Thomas Bell, Her Majesty's Inspector of Mines.

On the 29th July an examination was held at the Central Hall, Darlington, when 19 candidates presented themselves, 15 being from the Durham and 4 from other districts. At the conclusion of the examination six of the Durham and three externs were recommended for certificates of competency.

The examiners were Messrs. A. L. Steavenson (a member of the board), John Daglish, Tynemouth, and John Foreman, Durham.

Plans of Abandoned Mines. Section 42, *Mines Act*, 1872.

The following mines have been abandoned and plans sent to the Secretary of State during the past four years that I have had charge of the Durham district, 1875 to 1878 inclusive, viz.:—

Hob Hill Ironstone Mine, situated near Saltburn in Cleveland, belonging to Messrs. J. W. Pease and partners. Abandoned April 1875.

South Cleveland and Glaisdale Ironstone Mines, situated near Grosmont in Cleveland, belonging to the South Cleveland Ironworks Co., Limited. Abandoned June 1875.

North Grane Ironstone Mine, situated near to Stanhope in Weardale, belonging to the Weardale Coal and Iron Co., Limited. Abandoned July 1875.

South Groove Rake Ironstone Mine, situated and belonging to as above stated: also abandoned July 1875.

Rowan Tree B Ironstone Mine, situated and belonging to as above stated. Abandoned November 1875.

Butterknowle Coal Mine, situated in Lynesack and Softley, called "Wham Drift." Main Coal (Brockwell) Seam, belonging to J. S. Robson and partners, abandoned June 1876.

Findon Hill and Whitehouse Coal Mines, situated near Durham, belonging to Messrs. Pringle & Co. Five Quarter Seam at Findon Hill, and Five Quarter and Main Coal Seams at Whitehouse Pits, abandoned June 1876.

Merrybent Lead Mines, situated at Middleton Tyas, in Yorkshire, belonging to the Merrybent Mining Co., Limited. Abandoned July 1876.

Coate Moor Ironstone Mine, situated in Kildale, Cleveland, belonging to the Coate Moor Ironstone Co., Limited. Abandoned July 1876.

Old Durham Coal Mine, situated near Durham, belonging to the Marquis of Londonderry. Hutton Seam abandoned December 1876.

Bishop Middleham Coal Mine, situated near Sedgefield, belonging to the Weardale Coal and Iron Co., Limited. Five Quarter and Main Coal Seams, abandoned December 1876.

London Lead Co., Hilton Lead Mine. Plan and section situated on east side of Scordale Beck abandoned May 1877. Also plan and section of Silverband Lead Mine, 1847; plan and section of Runington Veins at Silverband, 1847; and plan and section of Swathbeck Lead Mine connected with Silverband Mine, 1847; abandoned August 1877. The above are all in Westmoreland.

Abbots Close Coal Mine, near Crook, belonging to the Trustees of the late Thomas Charlton & Co. Main Coal (Brockwell) Seam abandoned August 1877. Also of the Yard Coal Seam at their Greenhead Pit, abandoned April 1877.

Coxhoe Collieries, situated at Coxhoe near Ferry Hill, belonging to the Rosedale and Ferry Hill Iron Co., Limited, viz.: Coxhoe and South Kelloe, Coxhoe and Heugh Hall, Quarrington Hill, Bowburn, Five Quarter and Main Coal Seams, and the Coxhoe Harvey Seam, abandoned December 1877.

Copperside Coal Mine, situated near Woodlands, belonging to John Thompson. Main Coal Seam abandoned January 1878.

Waldridge Coal Mine, Byron Pit, situated near Chester-le-Street, belonging to the Waldridge Colliery Co. Five Quarter and Main Coal Seams abandoned March 1878.

Woodhouse Close Coal Mine, Tindale Fell, Emily Pit, situated near Bishop Auckland. Hutton Seam and Harvey Seam, belonging to the Trustees of Thomas Vaughan & Co., abandoned August 1878.

Middle Beechburn Coal Mine, situated near Crook, belonging to George Pears and Co. Five Quarter or Busty Seam abandoned October 1878.

Mr. W. N. Atkinson, who has again efficiently discharged the duties of Assistant-Inspector of the district, reports that during the past year he has travelled on 301 days on official duty, and a distance of 9,217 miles, has made 213 separate visits to mines, and 78 underground inspections, attended 52 inquests and 6 complaints of workmen, was 6 days engaged at arbitration, examinations, and other meetings, besides assisting in the general office work of the district.

I have travelled on 246 days, and a distance of 8,600 miles, on which days I have made over 200 separate visits of inspection to coal and other mines, both under and above ground, attended 50 inquests and adjournments, attended to 10 complaints of workmen, and 36 meetings in connexion with my official duties, consulting with owners and managers on various points connected with the working of the Acts, and have been 14 days in London. The East Hetton arbitration occupied me five days in attending and instructing solicitor, and on the days of hearing. The correspondence has again been very large and has occupied much time and attention. I have received over 4,000 letters, notices, returns, &c., which have involved the writing and sending out of near 3,000 letters, circulars, forms, and notices.

The instructions you issued in the early part of the year, as well as the working of the Act generally, have had my best attention and have been carried out as far as practicable.

I have, &c.,

THOMAS BELL,
Her Majesty's Inspector of Mines.

The Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department, Whitehall, S.W.

List of the Fatal Colliery Accidents, and Loss of Life arising therefrom, in Mr. Bell's District, comprising South Durham, Westmoreland, and the North Riding of Yorkshire, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Jan. 4	1	Tursdale -	Ferry Hill -	Bell Brothers, Limited -	Thos. Douglas -	Collier -	21	Fall of stone from roof while filling a tub; it gave no warning.	–	1	–	–	–	1
„ 7	2	Wingate Grange	Wingate -	Wingate Grange Coal Co.	John Longstaff -	Ditto -	35	Severe injury to head and spine by a fall of top coal in Main Coal. Died 2nd March.	–	1	–	–	–	1
„ 12	3	Elemore -	Fence Houses -	Hetton Coal Co. - -	James Nutt -	Watchman	55	Head struck by one of the horns on the drum; he went into the engine house, a place, as stated, he had no business to go.	–	–	–	–	1	1
„ 15	4	Thornley -	Ferry Hill -	Original Hartlepool Collieries Co., Limited.	Jacob Lamb -	Collier -	46	Thigh broken by a fall of roof. Died on 22nd inst.	–	1	–	–	–	1
„ 16	5	Eppleton -	Fence Houses -	Hetton Coal Co. - -	John Adamson -	Ditto -	40	Knee cut by fall of following stone while at work. Died 16th May.	–	1	–	–	–	1
„ 17	6	Newbottle Margaret.	Ditto - -	Earl of Durham - -	Alex. Stewart -	Shifter -	51	Back injured by fall of stone from a slip. Died on 22nd inst.	–	1	–	–	–	1
„ 18	7	Thornley -	Ferry Hill -	Original Hartlepool Collieries Co., Limited.	William Duffy -	Fireman -	35	Explosion of No. 1 boiler in Low Main Seam.	–	–	–	4	–	4
					Edward Miller -	Onsetter -	45							
					Robert Wilson -	Landing-man	17							
					John Oliman -	Rolly-way-man.	50							
„ 23	8	Harraton -	Chester-le-Street	Earl of Durham -	Joseph Ferguson -	Horse-driver	50	Crushed through being entangled with trace chain, got between it and waggon.	–	–	–	–	1	1
„ 24	9	East Howle -	Ferry Hill -	Carlton Iron Co., Limited	Geo. Hudson -	Collier -	42	Serious injury to back by fall of coal, neglect of spragging. Died 23rd March.	–	1	–	–	–	1
Feb. 2	10	Newbottle D Pit	Fence Houses -	Earl of Durham - -	Thos. Yellowley -	Master-shifter.	45	Caught by a fall of stone while renewing timber in an old board.	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Feb. 6	11	Binchester -	Bishop Auckland	Bolckow, Vaughan, & Co., Limited.	Geo. Wharton -	Collier -	30	Fall of stone; he had neglected to set a prop which had been knocked out by a shot, although warned to do so, and a large stone fell from roof.	–	1	–	–	–	1
„ 14	12	Tursdale -	Ferry Hill -	Bell Brothers, Limited -	Thos. Hall -	Putter -	17	Got his head crushed between his tub and a plank while riding on limbers.	–	–	–	1	–	1
„ 14	13	Ludworth -	Durham -	Original Hartlepool Collieries Co., Limited.	William Iley -	Heap-keeper	30	Leg badly crushed between waggons while passing between them. Died on 22nd.	–	–	–	–	1	1
„ 19	14	Cold Knott -	Crook - -	Wooler and Chapman -	Jos. Winter -	Collier -	30	Injuries to back by fall of clay band. Died 24th October.	–	1	–	–	–	1
„ 25	15	Byers Green -	BishopAuckland	Bolckow, Vaughan, & Co., Limited.	Andrew Eltringham	Shifter -	64	Right arm broken and lacerated by engine set on plain; he was riding out-bye in a tub, contrary to orders, when the chain broke.	–	–	–	1	–	1
Mar. 4	16	Seaham -	Seaham -	Marquess of Londonderry	John Clark -	Onsetter -	23	Crushed under cage while working on road near shaft bottom; the empty cage came down and caught him.	–	–	1	–	–	1
„ 6	17	Hetton (Blossom)	Fence Houses -	Hetton Coal Co. - -	Joseph Davidson -	Plumber -	30	Drowned in Main Coal Seam. Was sent with two men to wedge a pipe and tap in a borehole; orders were given not to touch the boring until the manager arrived, which order was disobeyed, and the hole put through, when a rush of water mixed with stythe took place, and on being overcome he fell among the water and was drowned. His body was not recovered until the 25th June.	–	–	–	1	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Mar. 7	18	Ushaw Moor -	Durham - -	H. Chaytor -	Joseph Taylor -	Collier -	28	Fall of stone from between two slips	–	1	–	–	–	1
„ 12	19	Murton -	Sunderland -	South Hetton Coal Co., Limited.	George Fisher -	Ditto -	29	Fall of a large stone from between two slips in the roof, in broken workings; it crushed out the timber in falling.	–	1	–	–	–	1
„ 19	20	North Hetton (Moorsley).	Fence Houses -	North Hetton Coal Co. -	Thos. Watson -	Greaser -	14	Severe injury to leg by slipping his foot into wheel hole while in motion. Died shortly after.	–	–	–	1	–	1
„ 25	21	Wheatley Hill	Thornley -	Original Hartlepool Collieries Co., Limited.	Alfred Grimwood -	Collier -	28	Explosion of gas in Main Coal Seam while firing a shot next to goaf in broken workings.	2	–	–	–	–	2
					Joseph Walker -	Deputy -	36							
April 3	22	Black Boy -	Auckland -	Bolckow, Vaughan, & Co., Limited.	Fred. Mayes -	Horse-driver	45	Got on trucks while they were being drawn along by hauling engine rope, and got crushed between truck and engine-house.	–	–	–	–	1	1
„ 5	23	Chilton -	Ferry Hill -	South Durham Coal Co. -	Benj. Richardson -	Sinker -	49	Fall of a wood crib and some stone while working in the bottom of a sinking pit; stone came off at a slip and forced the cribs and deals out.	–	–	1	–	–	1
„ 8	24	St. Helen's (Brockwell).	Bishop Auckland	Jos. Pease and Partners -	Anthony Maddison	Shiftman -	42	Burnt by explosion of gas, was using a candle instead of a lamp. Died on 20th.	1	–	–	–	–	1
„ 8	25	Westerton -	Ditto -	Bolckow, Vaughan, & Co., Limited.	Geo. Simpson -	Driver -	12	Burnt by explosion of gas in a stable in bye. Died on 18th.	1	–	–	–	–	1
„ 10	26	South Hetton -	Fence Houses -	South Hetton Coal Co., Limited.	David Plumpton -	Ditto -	14	Two tubs uncoupled and ran down an incline and crushing deceased who had left refuge stall contrary to orders after the set had left him.	–	–	–	1	–	1
„ 29	27	Etherley (George)	Bishop Auckland	Hy. Stobart & Co. -	John Grey -	Bank-head boy.	14	Run over by engine set after knocking off the rope.	–	–	–	1	–	1

List of Fatal Accidents—*continued.*

Date.	No of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	ause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878. May 7	28	Esh - -	Durham - -	Jos. Pease and Partners	Peter Wade -	Collier -	65	Fall of stone in a jud; he had fired a shot which loosened the timber, and having taken in a tub the road was blocked so as he could not get out of the place, although he heard the fall coming on. Died on 11th.	–	1	–	–	–	1
„ 9	29	Hedley Hill -	Waterhouses -	Weardale Iron and Coal Co., Limited.	Patrick Murphey -	Ditto -	64	Fall of stone while engaged in taking down a piece of post in roof.	–	1	–	–	–	1
„ 15	30	Newbottle (Margaret).	Fence Houses -	Earl of Durham - -	Francis McKinlay	Putter -	16	Injury to head by falling on tub-yoker. Supposed injury to brain.	–	–	–	1	–	1
„ 15	31	Haswell -	Ditto -	Haswell, Shotton, and Easington Coal and Coke Co., Limited.	Shipley Watson -	Deputy -	44	Fall of a large piece of stone while drawing a set of chocks out of a broken jud in Low Main Seam.	–	1	–	–	–	1
„ 15	32	Newbottle (Margaret).	Ditto -	Earl of Durham - -	Rob. Wallace -	Collier -	21	Severe bruises across the loins by a fall of stone while working in a broken jud. Died on 29th inst.	–	1	–	–	–	1
„ 16	33	Ryhope -	Sunderland -	Ryhope Coal Co., Limited	H. Gardner -	Run-rider -	17	Thrown off the front of engine set and run over; the first tub got off the way by a piece of stone falling on rail.	–	–	–	1	–	1
„ 18	34	Chester South Moor.	Chester-le-Street	Thiedemaun, Wallis, & Co.	John Robson -	Trapper -	12	Left his door (after being warned not to do so) and got on the limmers of a pony coming out-bye with a full tub, when his head was caught between the top of the tub and a plank, causing instant death.	–	–	–	1	–	1
„ 24	35	Leasingthorne -	Bishop Auckland	Bolckow, Vaughan, & Co., Limited.	Jonathan Butterworth.	Collier -	46	Fall of a large stone while sitting nicking his jud next to goaf.	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878. May 24	36	Leasingthorne	Bishop Auckland	Bolckow Vaughan, & Co., Limited.	John Wilson	Coupler	18	While running to get out of the way of incline set he went through the bottom of shaft, and the cage coming down at the time caught him, causing death.	–	–	1	–	–	1
„ 24	37	Lumley(6th Pit)	Fence Houses	Earl of Durham	Thos. Stoper	Ditto	16	While coupling tubs close to the shaft the corner of the descending cage caught him; he was out of his place, but a fence has now been put up so as to prevent anyone getting near the cage side.	–	–	1	–	–	1
„ 26	38	Tindale	St. Helen's	Jos. Pease and Partners	Ralph Gilmany	Shaftman	51	While engaged with others in repairing a chain pump at pit bottom, deceased signalled for the cage to be lifted, and before it moved he put his head into the shaft to call for something, when the cage came up and caught his head between the top bar and a buntin.	–	–	1	–	–	1
June 1	39	Castle Eden	Castle Eden	Johnson, Reay, and Johnson.	Robt. Rodgers	Chock-drawer.	34	While drawing a jud in broken a large stone fell from roof, crushing his head.	–	1	–	–	–	1
„ 4	40	Oakenshaw	Willington	Strakers and Love	Peter Hall	Helper-up	14	Fell down a ladder at bank and died from concussion of the brain.	–	–	–	–	1	1
„ 5	41	Eppleton	Fence Houses	Hetton Coal Co.	Wm. Bourne	Driver	13	Run over by a set of empty tubs while taking them in-bye.	–	–	–	1	–	1
June 8	42	Oakenshaw	Willington	Strakers and Love	John Bewick	Deputy	50	Fall of a large stone while drawing props out of an old board.	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
June 10	43	Etherley (Rush Pit).	Bishop Auckland	Hy. Stobart & Co. -	Thos. Sewell -	Engineman	45	While screwing up the hand-hole door of a boiler the bolt broke, causing a rush of hot water, which scalded him severely all over his body.	–	1	–	–	–	1
„ 14	44	Stanley -	Waterhouses -	Jos. Pease and Partners -	Samuel Harvey -	Collier -	20	Leg broken by fall of stone from a slip. Died 15th July.	–	1	–	–	–	1
„ 17	45	Old Durham -	Durham -	Marquess of Londonderry	John Connelly -	Ditto -	22	Fall of stone while he was getting coal in a broken jud.	–	1	–	–	–	1
„ 24	46	Holmside -	Chester-le-Street	Hedley Brothers - -	Joseph Atkinson -	Fireman -	32	Head crushed by the slipping of a chock while putting in a new boiler.	–	–	–	–	1	1
„ 28	47	Trimdon Grange	Trimdon -	Trimdon Grange Coal Co.	John Richardson -	Collier -	48	Heavy fall of stone, which came on suddenly while working in a jud.	–	1	–	–	–	1
July 3	48	South Hetton -	Fence Houses -	South Hetton Coal Co., Limited.	Francis Henderson	Joiner -	46	While engaged repairing a "drop" in the pit, he took the full tub out at bottom, then stepped into the empty cage, when it started by some unaccountable means, and crushed him between the cage hoop and flat sheets.	–	–	–	1	–	1
„ 5	49	Ryhope -	Sunderland -	Ryhope Coal Co., Limited	Wm. Frazer -	Collier -	28	Died from inflammation of the brain, the result of being struck on the head by a prop on the 14th June last.	–	–	–	1	–	1
„ 8	50	Hamsteels -	Durham - -	Johnson, Reay, and Johnson	Jos. Jenkins -	Ditto -	30	Severely crushed by fall of stone while taking off side coal for a landing. Died 20th July.	–	1	–	–	–	1
„ 12	51	South Durham	Bishop Auckland	South Durham Coal Co. -	Thos. Close -	Back-overman.	48	While putting a tram into low hole of double-deck cage, the breaksman lowered it, crushing close between the hoop of cage and flat sheets. A previous signal had been given to lower.	–	–	1	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
July 16	52	Wingate Grange	Wingate -	Wingate Grange Coal Co.	Henry Soulsby -	Driver -	13	Dislocation of neck, caused by his pony falling.	–	–	–	1	–	1
Aug. 9	53	Medomsley -	Consett - -	Consett Iron Co., Limited	Robert Hardy -	Collier -	27	Died from injuries received on 1st Dec. 1877 by fall of top coal.	–	1	–	–	–	1
„ 13	54	Iveston -	Leadgate -	Ditto - -	Wm. Sibbett -	Ditto -	21	Fall of band stone while working under it without sprags, contrary to orders.	–	1	–	–	–	1
„ 24	55	Whitworth Park	Spennymoor -	R. S. Johnson & Co. -	Thos. Dent -	Deputy -	32	Fall of a stone from roof, between two slips, while drawing timber.	–	1	–	–	–	1
Sept. 18	56	Haswell -	Fence Houses -	Haswell, Shotton, and Easington Coal and Coke Co., Limited.	Geo. Featonby -	Shifter -	36	Fall of stone on his head while building a stone pillar.	–	1	–	–	–	1
„ 19	57	Tudhoe -	Spennymoor -	Weardale Iron and Coal Co., Limited.	John Lee -	Collier -	28	Fall of stone on his head while kirving out bottom coal.	–	1	–	–	–	1
„ 25	58	Ryhope -	Sunderland -	Ryhope Coal Co., Limited	James Sproat -	Gasman -	59	Severe injury to his chest by falling over a barrow while at his work. Died on 30th.	–	–	–	–	1	1
Oct. 2	59	Ludworth -	Thornley -	Original Hartlepool Collieries Co., Limited.	Richard Rose -	Labourer -	37	Severely crushed by tub at tip end by pony running away and upsetting a tub of stone on him. He died next day.	–	–	–	–	1	1
„ 5	60	Seaham, No. 2 Pit.	Seaham -	Marquess of Londonderry	Martin Kelly -	Driver -	14	Head crushed by two tubs joining while putting in a sprag.	–	–	–	1	–	1
„ 7	61	Browney -	Durham -	Bell Brothers, Limited -	Geo. Crozier -	Shiftman -	48	Fall of stone in a stow-board while he was drawing a prop.	–	1	–	–	–	1
„ 9	62	Page Bank -	Willington -	Ditto - -	Jas. Gardner -	Collier -	27	Fall of stone while turning away a place out of an old waggon-way. The stone came off at a breaker on top of coal.	–	1	–	–	–	1
„ 18	63	Seaham -	Seaham -	Marquess of Londonderry	Thos. Rochester -	Driver -	13	Head crushed between tubs while coupling at landing.	–	–	–	1	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Oct. 19	64	Thornley -	Thornley -	Original Hartlepool Collieries Co., Limited.	Joseph Heard -	Labourer -	58	Run over by a waggon under screens while descending apparatus-hole.	–	–	–	–	1	1
„ 21	65	Willington, A Pit.	Willington -	Strakers and Love -	Michael Bailes -	Collier -	24	Serious injury to spine by a fall of stone in a broken jud. Died 2nd December.	–	1	–	–	–	1
„ 31	66	Cust Barn -	Cockfield -	Thos. Marr - -	Thos. Marr -	Owner of mine.	68	Overbalanced himself and fell down the shaft.	–	–	1	–	–	1
Nov. 1	67	Wheatley Hill	Thornley -	Original Hartlepool Collieries Co., Limited.	Arkless Collins -	Collier -	41	Injury to back on engine road. Died 21st November.	–	–	–	1	–	1
„ 5	68	Harraton -	Chester-le-Street	Earl of Durham - -	Ralph Crowe -	Shifter -	29	Fall of roof while working in an old stow-board.	–	1	–	–	–	1
„ 14	69	Herrington -	Fence Houses -	Ditto - - -	Coxon Gelson -	Driver -	13	Fell off his set of tubs and was run over while driving out-bye.	–	–	–	1	–	1
„ 21	70	Seaham -	Seaham -	Marquess of Londonderry	James Boyle -	Collier -	47	Injuries to head by set of tubs on incline plane; he left the refuge-hole before the second set had passed.	–	–	–	1	–	1
„ 25	71	Wheatley Hill	Thornley -	Original Hartlepool Collieries Co., Limited.	James Daw -	Timber-leader.	16	Injuries to toes. Died from erysipelas on 1st December.	–	–	–	1	–	1
„ 29	72	Wooley -	Crook - -	Jos. Pease and Partners -	Richard Lee -	Collier -	40	Fall of roof while working in a board.	–	1	–	–	–	1
	73	Seaham -	Seaham -	Marquess of Londonderry	Lawson Atkinson -	Ditto -	42	Severe injuries by fall of stone to head, hip, and foot. Died 5th December.	–	1	–	–	–	1
„ 4	74	Tindale -	Bishop Auckland	Jos. Pease and Partners -	John Hall - -	Driver -	14	Fell off the limmers while putting, and was run over by a full tub.	–	–	–	1	–	1
„ 9	75	Rainton -	Fence Houses -	Marquess of Londonderry	Geo. Ramsay -	Shifter -	59	Caught and run over by a set of full tubs on engine plain.	–	–	–	1	–	1
„ 18	76	Eppleton, Jane Pit.	Ditto -	Hetton Coal Co. - -	John Brodie - / Ralph Stoker -	Collier - / Ditto -	19 / 20	By fall of a large piece of stone while working in a broken jud in Hutton Seam.	–	2	–	–	–	2

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Dec. 20	77	Binchester -	Bishop Auckland	Bolckow, Vaughan, & Co., Limited.	John Coulthard -	Collier -	33	Fall of a large piece of stone while working in a wall.	–	1	–	–	–	1
„ 23	78	Seaham -	Seaham -	Marquess of Londonderry	Geo. Healer -	Chockman -	54	Leg broken and otherwise severely injured by fall of stone. Died 30th inst.	–	1	–	–	–	1
								Total - -	4	37	7	25	10	83

X x 4

List of the Fatal Accidents in Metalliferous Mines, and Loss of Life arising therefrom, in Mr. Bell's District, comprising South Durham, Westmoreland, and the North Riding of Yorkshire, during the Year 1878.

1878.														
Mar 15.	1	Killhope -	Weardale -	W. B. Beaumont -	Thos. Harrison -	Miner -	19	Explosion of powder; while in the act of firing a hole, which he had just previously charged, it exploded while he was applying the match; supposed to have been some loose powder.	–	–	–	1	–	1
May 9	2	Old Gang -	Reeth - -	Old Gang Mining Co. -	James Alton -	Ditto -	31	Fall of roof and *debris* by the timber giving way.	–	1	–	–	–	1
Aug. 6	3	Rowantree, A -	St. John's Chapel	Weardale Iron and Coal Co., Limited.	John Ayton -	Ditto -	27	Fall of stone from the roof; it came off at a slip.	–	1	–	–	–	1
„ 20	4	Jeffries - -	Blanchland -	Derwent Mining Co., Limited.	Robert Elliott -	Ditto -	24	Fall of a stull while working at the back of a level.	–	1	–	–	–	1
Oct. 2	5	SirFrancis Level	Gunnerside -	AD Mining Co. - -	Joseph Brunskill -	Ditto -	29	Fall of ground from between cheeks of lode.	–	1	–	–	–	1
								Total - -	–	4	–	1	–	5

List of the Fatal Accidents, and Loss of Life arising therefrom, in the Cleveland Ironstone portion of Mr. Bell's District, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878.														
Jan. 3	1	Normanby -	Middlesbro' -	Bell Brothers, Limited -	Jethro Clements -	Driver -	14	Fall of a large prop caused by horse running against it with his limmers.	–	–	–	1	–	1
„ 3	2	Grosmont -	Grosmont -	Bagnall & Co. - -	Thomas Breckon -	Miner -	35	The set took wrong way at points and crushed him against wall.	–	–	–	1	–	1
Mar. 2	3	Rosedale, West	Rosedale -	Rosedale & Ferry Hill Iron Co., Limited.	Geo. Wilson -	Ditto -	24	Got on set of waggons on surface, contrary to rule, and fell off and was run over; repeated warnings had been given not to ride on waggons.	–	–	–	–	1	1
„ 15	4	Eston - -	Middlesbro' -	Bolckow, Vaughan, & Co., Limited.	Thos. Jackson -	Engine siding man.	63	Run over by waggons; he attached the rope to wrong part of the set, when the remaining waggons ran back upon him.	–	–	–	1	–	1
Apr. 17	5	South Skelton -	Guisbro' -	Trustees of T. Vaughan & Co.	Wm. Edwards -	Miner -	50	Struck on head by a piece of stone from a shot, which rebounded from the opposite side of wall.	–	–	–	1	–	1
„ 22	6	Eston - -	Middlesbro' -	Bolckow, Vaughan, & Co., Limited.	Geo. Walker -	Ditto -	27	Fall of large piece of ironstone from top while bearing it down.	–	1	–	–	–	1
May 13	7	Upleatham -	Marske - -	J. W. Pease and Partners	Jas. Brigdon -	Ditto -	46	Left arm broken and other bruises by fall of top stone while at work. Died on 19th May.	–	1	–	–	–	1
„ 31	8	Normanby -	Middlesbro' -	Bell Brothers, Limited -	Thos. Charlton -	Ditto -	28	Severely injured about back and hips by fall of stone while bearing it down on the 19th July last.	–	1	–	–	–	1
June 13	9	Boosbeck -	Guisbro' -	Steavenson, Jacques, & Co.	Geo. Halton -	Water-leader	50	While crossing the engine road he slipped on the rail and fell on the way, when a full set of tubs ran over him.	–	–	–	1	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.	Total.
1878. June 25	10	North Skelton	Saltburn	Bolckow, Vaughan, & Co., Limited.	John Cottle	Miner	38	Fall of top dogger while he was in the act of drilling a hole.	–	1	–	–	–	1
26	11	Eston	Middlesbro'	Ditto	Francis Large	Ditto	23	Both eyes destroyed and otherwise severely burnt by an explosion of powder while charging a shot-hole. Died 2nd July.	–	–	–	1	–	1
July 15	12	Upleatham	Marske	J. W. Pease and Partners	John Spaul	Ditto	56	Fall of stone from the face, which had been loosened by two shots.	–	1	–	–	–	1
Aug. 6	13	Whitecliffe	Saltburn	Ditto	John Ridley	Deputy	29	Fall of shale from roof while timbering a board.	–	1	–	–	–	1
„ 19	14	Huntcliffe	Ditto	Bell Brothers, Limited	Horace Stanley	Driver	14	He lost his light and fell before a set of tubs and was run over.	–	–	–	1	–	1
Sept. 2	15	Eston	Middlesbro'	Bolckow, Vaughan, & Co., Limited.	Robt. Feaver	Miner	31	Fall of ironstone in a broken jud after firing two shots; he was examining the place at the time.	–	1	–	–	–	1
Oct. 8	16	Boosbeck	Guisbro'	Steavenson, Jacques,& Co.	James Duckering	Ditto	22	Whilst taking off the corner of a pillar he drilled a hole nearly through the stone; after charging and lighting the shot he went round to other side, and the shot blew through and killed him.	–	–	–	1	–	1
Nov. 19	17	Ditto	Ditto	Ditto	Wm. Hutchinson	Run-rider	19	Broken leg by tub running amain against him. Died on 28th inst.	–	–	–	1	–	1
								Total	–	7	–	9	1	17

LIST OF MINES classed under the COAL MINES REGULATION ACT, in MR. THOMAS BELL'S DISTRICT 1878 and 1879.

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Certificated Managers and Agents (*Italics*).
Atkinson, Thos., Hamsterley, viâ Bishop Auckland.	Crane Row	Hamsterley	*Thos. Atkinson, Owner.
Bainbridge, The Trustees of the Manor of, Hawes, Bedale (Yorks).	Mossdale Gill (standing).	Wensleydale	*Standing.
Bearpark-Brancepeth Coal Co., Limited, Bearpark Colliery, Durham.	Bearpark-Brancepeth	Durham	B. Dodd, and *Agent.*
Bell Bros., Limited, Middlesbro'-on-Tees.	Browney	Ditto	R. Harle } *A. L. Steavenson.*
Ditto	Page Bank	Willington	W. Harle } *A. L. Steavenson.*
Ditto	Tursdale (standing)	Ferry Hill	W. Ramsay } *A. L. Steavenson.*
Bolckow, Vaughan, & Co., Limited, Middlesbro'-on-Tees (E. W. Richards, Chief Agent.)	Auckland Park	Bishop Auckland	F. Clowes
Ditto	Binchester	Ditto	M. S. Hall
Ditto	Black Boy	Ditto	F. Clowes
Ditto	Byers Green	Spennymoor	T. Mitchell
Ditto	Hunwick	Willington	Mark Hall } *R. Robinson.*
Ditto	Leasingthorne	Bishop Auckland	T. Stephenson } *R. Robinson.*
Ditto	Newfield	Willington	Mark Hall } *R. Robinson.*
Ditto	Shildon Lodge	Bishop Auckland	R. Colling } *R. Robinson.*
Ditto	West Auckland	Ditto	W. S. Oliver } *R. Robinson.*
Ditto	Westerton (standing)	Ditto	T. Stephenson } *R. Robinson.*
Ditto	White Lee (standing)	Crook, Darlington	S. T. Jones } *R. Robinson.*
Ditto	Woodifield	Ditto	S. T. Jones } *R. Robinson.*
Brogden, John, Barras, Brough, Westmoreland.	Barras	Barras, Brough	*John Brogden, Owner.
Broomside Coal Co., Durham	Broomside	Durham	John Jarrett, and *Agent.*
Brunton and Walker, Fryup, Lealholm, Yarm (Yorks).	Poverty Hill	Castleton	*W. Brunton, Owner.
Burn, J. H., Newcastle-on-Tyne	West Stanley, Lamp (standing).	Chester-le-Street	W. Johnson. *W. Wilson Smith.*
Ditto	„ Kettledrum	Ditto	W. Johnson. *W. Wilson Smith.*
Ditto	„ Fanny	Ditto	W. Johnson. *W. Wilson Smith.*
Butterknowle Coal Co., Cockfield, Darlington.	Butterknowle, Diamond Pit.	Cockfield	J. S. Robson, and *Agent.*
Ditto	„ Marsfield Drift.	Ditto	J. S. Robson, and *Agent.*
Ditto	„ Quarry Pit	Ditto	J. S. Robson, and *Agent.*
Cain, John, Sedbusk, Hawes, Bedale (Yorks).	Catterdale Fell	Hawes	*John Cain, Owner.
Carlton Iron Co., Limited, Carlton, Stockton-on-Tees.	East Howle	Ferryhill	H. N. Ground. *Thos. Kirk.*
Ditto	Thinford Grange (standing).	Ditto	H. N. Ground. *Thos. Kirk.*
Caygill, Jos., William Gill Colliery, near Reeth, Richmond (Yorks).	William Gill	Reeth	*Jos. Caygill, Owner.
Chapman and Morson, Crook, Darlington.	Crook	Crook	W. Whitfield. *Wm. Morson.*
Charlton, T., & Co., Trustees of, Middlesbro'-on-Tees.	Beechburn (standing)	Ditto	W. Walker, and *Agent.*
Ditto	Evenwood (ditto)	Evenwood	W. Walker, and *Agent.*
Ditto	Storey Lodge (ditto)	Cockfield	W. Walker, and *Agent.*
Ditto	Tees Hetton (ditto)	Evenwood	W. Walker, and *Agent.*
Chaytor, Henry, Witton Castle, by Darlington.	Carterthorne	Witton-le-Wear	B. Armstrong } *Felix McGowan.*
Ditto	Ushaw Moor	Durham	John Bell, Jr. } *Felix McGowan.*
Ditto	Witton Park (standing).	Witton-le-Wear	Standing } *Felix McGowan.*
Consett Iron Co., Limited, Blackhill, co. Durham (W. Jenkins, Chief Agent).	Billingside Drift (standing).	Leadgate	
Ditto	Blackhill Drift	Medomsley, Newcastle	
Ditto	Brooms Drift (standing).	Leadgate	

* Marked thus are small collieries not requiring a certificated manager.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Certificated Managers and Agents (*Italics*).
Consett Iron Co., Limited, Blackhill, co. Durham (W. Jenkins, Chief Agent).	Delves (standing)	Leadgate	J. J. Hedley
Ditto	Eden	Ditto	*W. H. Hedley.*
Ditto	Eden Drift	Ditto	
Ditto	Iveston	Ditto	
Ditto	Derwent (standing)	Medomsley, Newcastle	
Ditto	Medomsley	Ditto	J. Morris
Ditto	Medomsley Edge	Ditto	
Ditto	Milkwell Burn (standing).	Ebchester, Newcastle	Standing
Ditto	Westwood	Medomsley, ditto	W. Kirkley
Ditto	Langley Park	Witton Gilbert	W. Logan, and *Agent.*
Crawford, T., Littletown, Durham.	Elvet	Durham	J. Golightly.
Dinsdale, Alexander, Brown Moor, Hawes, Bedale (Yorks).	Storth	Hawes	*A. Dinsdale, Owner.
Dunsaney, Lord, and Parts., Pelton Colliery, Chester-le-Street.	Newfield	Chester-le-Street	J. Ritson. *W. Armstrong.*
Ditto	Pelton Fell	Ditto	
Durham, Earl of, Lambton Offices, Fence Houses (H. T. Morton, Chief Agent).	Brasside	Durham	T. Dawson
Ditto	Cocken	Ditto	Ditto *T. Crawford.*
Ditto	Lady Durham	Sherburn, Durham	T. Crawford, jr.
Ditto	Littletown	Ditto	Ditto
Ditto	Sherburn Hill	Ditto	T. Crawford
Ditto	,, House	Ditto	Ditto
Ditto	Bourn Moor, D Pit	Fence Houses	J. Baxter
Ditto	,, Lady Ann	Ditto	Ditto
Ditto	Herrington	Newbottle, Fence Houses.	P. Tate *W. Lishman.*
Ditto	Newbottle, Dorothea	Ditto	Ditto
Ditto	,, Margaret	Ditto	Ditto
Ditto	Houghton	Fence Houses	J. Stokoe
Ditto	Harraton	Chester-le-Street	J. Southern
Ditto	Lumley, 2nd Pit (standing).	Fence Houses	R. Scorer *Thos. Robson.*
Ditto	,, 6th Pit	Ditto	Do.
East Hetton Coal Co., Coxhoe, Durham.	East Hetton	Coxhoe, Durham	Thos. Hall. *W. O. Wood.*
Elliot and Hunter, Quay, Newcastle-on-Tyne.	Charlaw	Durham	
Ditto	Nettlesworth	Ditto	R. Oliver. *W. Green.*
Ditto	Sacriston (standing)	Ditto	
Ditto	Witton	Ditto	
Ditto	Kimblesworth	Ditto	S. Tate. *John Daglish.*
Ferens and Love, Market Place, Durham.	Cornsay	Ditto	J. Davison.
Ditto	Inkerman	Tow Law	
Ditto	Lanchester (standing)	Lanchester	
Ferry Hill Coal Co., Limited, North Road, Darlington.	Ferry Hill (standing)	Ferry Hill	W. Reed.
Fletcher and Sowerby, Newcastle-on-Tyne.	Burnhope	Lanchester	T. Crawford. *H. Andrews.*
Framwellgate Coal Co., Middlesbro'-on-Tees.	Dryburn Grange (standing).	Durham	John Shiel. *V. W. Corbett.*
Ditto	Framwellgate	Ditto	
Fryer & Co., Darlington	New Copley	Cockfield	T. Shipley, and *Agent.*
Greenwell, J. M., Broomshields, viâ Darlington.	Gladdow	Cornsay	*J. M. Greenwell, Owner.
Halliday, R., Hill Top, Durham	Hill Top	Durham	R. Halliday.
Haswell, Shotton, & Easington Coal and Coke Co., Limited, Newcastle-on-Tyne.	Haswell	Fence Houses	T. Dormand *W. F. Hall.*
Ditto	Shotton (standing)	Castle Eden	G. Hornsby

* Marked thus are small collieries not requiring a certificated manager.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Certificated Managers and Agents (*Italics*).
Hedley Bros., Newcastle-on-Tyne.	Cragghead (standing)	Chester-le-Street	J. Fairley, and *Agent.*
Ditto	Holmside	Ditto	
Hedley & Bell, Newcastle-on-Tyne.	Charley	Annfield Plain	Jos. Gray.
Ditto	Louisa (standing)	Stanley	
Ditto	Morrison (ditto)	Annfield Plain	
Hedley, W. H., & Co., Norwood by Darlington.	Gordon House (ditto)	Cockfield	W. H. Hedley, and *Agent.*
Hedley Hope Coal Co., Middlesbro'-on-Tees.	East Hedley Hope	Tow Law	Jas. Hunter. *Wm. Hanson.*
Ditto	Hedley Hope (standing).	Ditto	
Hetton Coal Co., Fence Houses	Elemore	Fence Houses	Thos. Lishman. *Lindsay Wood.*
Ditto	Eppleton	Ditto	
Ditto	Hetton	Ditto	
Hogg, Walton, & Co., East Beechburn, Howden-le-Wear, Darlington.	East Beechburn	Howden	H. I. Mein.
Howden Coal and Firebrick Co., Howden-le-Wear, Darlington.	Howden	Ditto	R. Armstrong. *Geo. Hutchinson.*
Hutton Henry Coal Co., Limited, Darlington.	Hutton Henry	Wingate	R. Thompson, and *Agent.*
Ditto	South Wingate (standing).	Ditto	
Johnson, Reay, and Johnson, Whitworth, Spennymoor.	Hamsteels	Durham	Geo. Fletcher.
Johnson, R. S., & Co., Whitworth, Spennymoor.	Castle Eden	Castle Eden	J. Laverick.
Ditto	Spennymoor (Martin)	Ferry Hill	H. Hornsby.
Ditto	Whitworth Park	Ditto	Ditto.
Kellett, John, and Part., Bishop Auckland, Darlington.	Ivesley	Ivesley	W. Kellett.
Kellett & Sowden, West Woodifield Colliery, Crook, Darlington.	West Woodifield	Crook, Darlington	Thos. Snowdon, and *Agent.*
Knowles & Co., Swandale, Reeth, Richmond (Yorks).	Tan Hill	Swandale	James Harker, and *Agent.*
Lishman, J., & Co., Claypath, Durham.	Crook Hall	Durham	W. Lishman, and *Agent.*
Lloyd & Co., Middlesbro'-on-Tees.	West Hunwick (standing).	Bishop Auckland	Standing.
Londonderry, Marquess of, Seaham, Sunderland (J. B. Eminson, Chief Agent).	Adventure	Fence Houses	R. Laverick
Ditto	Alexandrina	Ditto	
Ditto	Rainton	Ditto	
Ditto	Old Durham (standing).	Durham	H. E. Hughes
Ditto	Seaham	Sunderland	H. T. M. Stratton
Ditto	Silksworth	Ditto	F. S. Panton. *John Daglish.*
			V. W. Corbett.
Love, J. H., & Part., Market place, Durham.	Houghall	Durham	H. Gustard. *W. O. Wood.*
Ditto	Shincliffe (standing)	Ditto	
Love and Son, Lanchester, Durham.	Browney Bank	Lanchester	*G. Love, Junr.
Ditto	Rackwoodside	Ditto	
Mainsforth Coal Co., Ferry Hill	Mainsforth (standing)	Ferry Hill	Standing.
Mallestang Coal Co., Kirby Stephen, Westmoreland.	Mallestang	Kirby Stephen	*J. Scott.
Marr, Thos., the executors of the late, Copley, Cockfield, Darlington.	Cust Barn	Cockfield	*Thos. Marr.
Marshall Green Coal Co., Witton-le-Wear, Darlington.	Marshall Green	Witton-le-Wear	J. O. Walton.

* Marked thus are small Collieries not requiring a certificated Manager.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Certificated Managers and Agent (*Italics*).
New Brancepeth Coal Co., St. John's Chambers, Newcastle-on-Tyne.	New Brancepeth	Durham	A. Pearson. *B. Cochrane.*
North Beechburn Coal Co., Howden-le-Wear, Darlington.	North Beechburn	Crook	C. Widdas and *Agent.*
Ditto	Rough Lea	Willington	
North Brancepeth Coal Co., Limited, Bondgate, Darlington.	Boyne (standing)	Durham	
Ditto	Broom Park (standing).	Ditto	J. L. Moreland. *R. Thompson.*
Ditto	Littleburn	Ditto	
Ditto	West Broom (standing).	Ditto	
North Hetton Coal Co., Fence Houses.	North Hetton	Fence Houses	T. Wood. *Lindsay Wood.*
Ditto	Hazard	Ditto	
Ditto	Pittington	Ditto	
Norwood Coal Co., Norwood Colliery, viâ Darlington.	Chatham Drift	Evenwood	E. Charlton, and *Agent.*
Ditto	Norwood	Ditto	
Ditto	Thrushwood (standing).	Ditto	
Original Hartlepool Collieries Co., Limited, Ferry Hill.	Ludworth	Thornley, Ferry Hill	W. Robson
Ditto	Thornley	Ditto	W. Hall *P. Cooper.*
Ditto	Wheatley Hill	Ditto	J. Elwin
Ord and Maddison, Darlington	Hummerbeck (standing).	Bishop Auckland	Standing.
Ditto	West Copley	Cockfield	T. Simpson.
Osmondcroft Coal and Brick Co., Limited, Winston, Darlington.	Osmondcroft	Winston, Darlington	Jos. Teasdale, and *Agent.*
Pease, Jos., & Parts., Darlington. (David Dale, Chief Agent).	Adelaide	Bishop Auckland	J. Barnes *J. Bigland.*
Ditto	Saint Helens	Ditto	J. Bigland
Ditto	Tindale	Ditto	
Ditto	Windlestone (standing).	Ferry Hill	
Ditto	Arthur (standing)	Crook	W. Wilde *T. Douglas.*
Ditto	Bowden Close	Willington	
Ditto	Emma (Roddymoor)	Crook	
Ditto	Job's Hill (standing)	Ditto	
Ditto	Lucy (No. Roddymoor) (standing).	Ditto	
Ditto	Brandon	Ditto	J.G.Crofton
Ditto	Esh	Durham	
Ditto	Stanley	Crook	
Ditto	Sunniside	Ditto	M. Holliday
Ditto	Wooley	Ditto	
Rosedale and Ferry Hill Iron Co., Limited, Newcastle-on-Tyne.	Thrislington	Ferry Hill	M. H. Wood, and *Agent.*
Ryhope Coal Co., Limited, Ryhope, Sunderland.	Ryhope	Sunderland	Jos. Routledge. *W. F. Hall.*
Sharp, John, Low Beechburn, Crook, Darlington.	Low Beechburn	Crook, Darlington	Geo. Scott. *F. Mitchell.*
Shildon Coal Co., Shildon, Darlington.	Shildon	Shildon, ditto	A. Mein. *G. Pears.*
South Durham Coal Co., Bishop Auckland, Darlington.	Chilton	Ferry Hill	J. Dakers, and *Agent.*
Ditto	Eldon (standing)	Bishop Auckland	F. Darling *John Johnson.*
Ditto	South Durham	Ditto	Ditto
South Hetton Coal Co., Limited, Fence Houses.	Murton	Sunderland	Geo. Bailes *R. Forster.*
Ditto	South Hetton	Fence Houses	Ed. Cowey
Spence, J. C., Staindrop, Darlington.	Morley Main	Etherley	*J. C. Spence, Owner.

* Marked thus are small Collieries not requiring a certificated Manager.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Certificated Managers and Agents (*Italics*).	
Stobart, Hy., & Co., Witton-le-Wear, Darlington.	Etherley, George	Etherley	W. Redshaw	
Ditto	„ Jane	Ditto	Geo. Bradford	*Geo. Bradford.*
Ditto	Lands	Cockfield	Geo. Young	
Ditto	Newton Cap	Bishop Auckland	J. Denham	
Ditto	Railey Fell	Evenwood	Geo. Young	
Strakers and Love, Newcastle-on-Tyne.	Brancepeth, A pit	Willington, Durham	D. Greaves	*W. Heppell.*
Ditto	„ C pit (standing).	Ditto		
Ditto	Oakenshaw, B pit (standing).	Ditto		
Ditto	Brandon, A and B pits (standing).	Ditto	J. J. Lishman.	
Ditto	„ C pit	Ditto		
Ditto	Willington, A pit	Ditto	John Love	
Ditto	„ B pit	Ditto		
Ditto	„ C pit (standing).	Ditto		
Summerson, R., & Co., Cockfield, Darlington.	Vane's Hartley	Cockfield	J. Dakers.	*W. Summerson.*
Thiedemann and Wallis, Newcastle-on-Tyne.	Chester South Moor	Chester-le-Street	W. Morris.	*W. Gillies.*
Ditto	Waldridge	Ditto		
Ditto	„ Busty	Ditto		
Trimdon Coal Co., Trimdon, Ferry Hill.	Deaf Hill (standing)	Ferry Hill	J. Fletcher.	*T. Watson.*
Ditto	Trimdon	Ditto		
Trimdon Grange Coal Co., Trimdon, Ferry Hill.	Trimdon Grange	Ditto	Geo. Cooke.	*W. O. Wood.*
Tyzack, S., & Co., Sunderland	Edmondsley	Chester-le-Street	John Hodgson.	*W. Branfoot.*
Vaughan, T., & Co., Trustees of, Middlesbro'-on-Tees.	Woodhouse-close	Bishop Auckland	J. Defty.	*Geo. Neasham.*
Victoria Coal Co., Witton-le-Wear, Darlington.	Victoria (standing)	Ditto	Standing.	
Veitch & Co., Coundon, Bishop Auckland.	Coundon (ditto)	Ditto	Do.	
Weardale Iron & Coal Co., Limited, Tudhoe, Ferry Hill. (J. Rogerson, Chief Agent.)	Bishop Middleham (standing).	Ferry Hill	Do.	
Ditto	Bishop's Close	Spennymoor	J. W. Laverick	*W. Elliott.*
Ditto	Croxdale	Durham	W. Johnson	
Ditto	Middridge, Charles (standing).	Shildon	Standing	
Ditto	Middridge, Eden (standing).	Ditto	Do.	
Ditto	Tudhoe	Durham	W. Johnson	
Ditto	Tudhoe Grange (standing).	Ditto	J. W. Laverick	
Ditto	Black Prince	Tow Law, Darlington	H. White	*J. R. Crone.*
Ditto	Elm Park (standing)	Ditto	Standing	
Ditto	Hedley Hill	Ditto	T. Teasdale	
Ditto	Old Thornley (standing).	Ditto	H. White	
Ditto	West Thornley	Ditto	H. White	
Walker, Simpson, & Co., Cockfield, Darlington.	North End	Cockfield	Thos. Dakers.	
Walton, Thomas, Brough, Kirby Stephen, Westmoreland.	Borrowdale	Brough	*Thos. Walton, Owner.	
West Beechburn Coal Co., Tow Law, Darlington.	West Beechburn	Tow Law, Darlington	T. Snowden.	
Whitwell Coal Co., Durham	Whitwell (standing)	Durham	G. Heslop.	
Wilkinson, G., Langley Mill, Durham.	Langley (standing)	Ditto	Standing.	
Wingate Grange Coal Co., Ferry Hill.	Wingate Grange	Ferry Hill	W. Armstrong, Jun., and *Agent.*	
Witton Fire-brick, &c. Co., Darlington.	Witton-le-Wear	Darlington	J. Widdas.	

* Marked thus are small Collieries not requiring a certificated Manager.

List of Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Certificated Managers and Agent (*Italics*).
Wolsingham Park, Dinas, and Fire-brick Mineral Co., Limited, Newcastle-on-Tyne.	Wolsingham Park (standing).	Wolsingham - -	Standing.
Wooler, Chapman, & Co., Crook, Darlington.	Cold Knott - -	Crook - -	T. Liddel. *G. Chapman.*
Ditto - - -	Hargill (standing) -	Ditto - - -	
Woodlands Coal Co., Darlington	Crake Scarr - -	Cockfield - -	A. Metcalfe, and *Agent.*
Ditto - - -	Woodlands - -	Ditto - - -	
Ditto - - -	Wooley Hills Drift (standing).	Ditto - -	

LIST OF IRONSTONE MINES classed under the COAL MINES REGULATION ACT, in MR. THOMAS BELL'S DISTRICT, 1878 and 1879.

Bagnall & Co., Grosmont, York	Grosmont - -	Grosmont - - -	W. Armstrong.
Barningham, Wm., Springfield, Darlington.	Aysdalegate (standing).	Guisbro' - -	Standing.
Bell Bros., Limited, Middlesbro'-on-Tees.	Carlin How (standing).	Saltburn-by-the-Sea -	W. Moore — *A. L. Steavenson.*
Ditto - - -	Skelton (standing) -	Ditto - - -	
Ditto - - -	Skelton Park - -	Guisbro' - - -	
Ditto - - -	Cliff (standing) -	Saltburn-by-the-Sea -	W. Anderson — *A. L. Steavenson.*
Ditto - - -	Huntcliffe - -	Ditto - -	
Ditto - - -	Normanby - - -	Middlesbro' - -	A. Varty — *A. L. Steavenson.*
Blakey Iron Co., Pickering, York	Blakey (standing) -	Castleton - -	W. Martin.
Bolckow, Vaughan, & Co., Limited, Middlesbro'-on-Tees. (E. W. Richards, Chief Agent.)	Chaloner - -	Guisbro' - - -	T. Lee, and *Agent.*
Ditto - - -	Eston - - -	Middlesbro' - -	
Ditto - - -	Upsal (standing) -	Guisbro' - - -	
Ditto - - -	Longacres - -	Saltburn-by-the-Sea-	G. Robinson, and *Agent.*
Ditto - - -	North Skelton -	Ditto - -	
Carlton Iron Co., Limited, Carlton, Stokton-on-Tees.	Ailesbury - -	Stokesley - -	R. Bell.
Charlton, T., & Co., Trustees of, Middlesbro'-on-Tees.	Slapewath - -	Guisbro' - -	W. Charlton, and *Agent.*
Foster, John, and Son, Egton Bridge, viâ Yarm.	Esk Valley (standing)	Grosmont - -	T. Evans, and *Agent.*
Ditto - - -	Wintergill - -	Ditto - -	
Gjers, Mills, & Co., Middlesbro'-on-Tees.	Spa - - -	Guisbro' - -	F. Tate.
Hansell, Robt., Rosedale Abbey, Pickering, York.	Lane Head (standing)	Rosedale - -	Robt. Hansell, Owner.
Kilton Ironstone Co., Saltburn-by-the-Sea.	Kilton (standing) -	Saltburn-by-the-Sea-	E. Hamilton, and *Agent.*
Liverton Iron Co., Limited, Saltburn-by-the-Sea.	Liverton (standing) -	Ditto - - -	G. Lee.
Loftus Iron Co., Limited, Saltburn-by-the-Sea.	North Loftus (standing).	Ditto - -	Standing.
Morrison & Co., Saltburn-by-the-Sea.	Brotton - -	Ditto -	B. Farrow. *D. W. Dixon.*
Palmer's Ship-building and Iron Co., Limited, Newcastle-on-Tyne.	Grinkle - -	Port Mulgrave -	J. Hodgson. *A. M. Palmer.*
Ditto - - -	Port Mulgrave (standing).	Ditto - -	
Pease, J. W., and Parts., Darlington. (David Dale, Chief Agent).	Cragg's Hall -	Saltburn-by-the-Sea -	W. France, and *Agent.*
Ditto - - -	Lofthouse - -	Ditto - -	
Ditto - - -	Whitecliffe (standing)	Ditto - -	
Ditto - - -	Lingdale - -	Ditto - -	C. Heslop, and *Agent.*
Ditto - - -	Tocketts (standing) -	Ditto - -	W. Walton, and *Agent.*
Ditto - - -	Upleatham - -	Ditto -	
Robson, Maynard, & Co., Middlesbro'-on-Tees.	Kirkleatham -	Redcar - -	W. Walker, and *Agent.*
Rosedale and Ferry Hill Iron Co., Limited, Newcastle-on-Tyne.	Rosedale, East (standing).	Pickering, York -	J. Roscamp, and *Agent.*
Ditto - - -	„ West (do.) -	Ditto - -	
Ditto - - -	„ Sheriff's Pit (standing).	Ditto - -	

List of Ironstone Mines classed under the Coal Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situated.	Certificated Managers and Agent (*Italics*).
Snowdon, Windle, & Co., 3, Bridge Street, Whitby.	Eskdaleside (standing).	Grosmont	Standing.
South Cleveland Ironworks Co., Limited, Glaisdale, Yarm.	Glaisdale (standing)	Glaisdale	Ditto.
Stanghow Ironstone Co., Saltburn-by-the-Sea.	Stanghow (standing)	Saltburn	E. Hamilton, and *Agent.*
Stephenson, Jacques, & Co., Middlesbro'-on-Tees.	Boosbeck	Ditto	W. Walker, and *Agent.*
Swan, Coates, & Co., Trustees of, Middlesbro'-on-Tees.	Ormesby	Middlesbro'	Ditto (ditto).
Vaughan, T., & Co., Mortgagees of, Middlesbro'-on-Tees.	South Skelton	Saltburn	J. Thompson, and *Agent.*
Weardale Iron and Coal Co., Tudhoe, Ferry Hill.	Belmont	Guisbro'	W. Robinson. *Thos. Allison.*
Ditto	Spa Wood (standing)	Ditto	

List of Mines classed under the Metalliferous Mines Regulation Act, in Mr. Thomas Bell's District, 1878 and 1879.

Owner or Company, and Postal Address.	Name of Mine.	Where situated.	Remarks.
	CUMBERLAND.		
Robinson, J. H., 25, Westgate Road, Newcastle-on-Tyne.	Tees Side	Alston Moor	Lead.
	DURHAM.		
Beaumont, W. B., Allenheads, Northumberland (J. C. Cain, Chief Agent).	Burtree Pasture	Weardale	Ditto.
Ditto	Craig's Level	Ditto	Ditto.
Ditto	Green Laws	Ditto	Ditto.
Ditto	Killhope	Ditto	Ditto.
Ditto	Rookhope	Ditto	Ditto.
Ditto	Slitt	Ditto	Ditto.
Ditto	Stanhope Burn	Ditto	Ditto.
Byers, Joshua S., Stockton-on-Tees.	Grass Hill	Harwood Middleton	Ditto.
Coates and Knox, Craddock Street, Spennymoor.	Tudhoe, Whinstone	Tudhoe	Whinstone.
Collinson, George and Joseph, Middleton-in-Teesdale.	East and West Pike Law.	Middleton-in-Teesdale	Lead.
Davidson, Francis, Butcher Race, Spennymoor.	Hett, Whinstone	Hett	Whinstone.
Derwent Mining Co., Limited, Blanchland, Riding Mill.	Jeffries	Blanchland	Lead.
Ditto	East Whiteheaps (standing).	Ditto	Ditto.
Ditto	Nookton (standing)	Ditto	Ditto.
Dubby Syke Mining Co., Limited, 25, Westgate Road, Newcastle-on-Tyne.	Dubby Syke	Harwood Fell	Ditto.
Green Hurth Mining Co., Limited, 25, Westgate Road, Newcastle-on-Tyne.	Green Hurth	Green Hurth Fell, Harwood	Ditto.
Harehope Gill Mining Co., Blackhill, Durham.	Harehope Gill (standing).	Edmondbyers	Ditto.
Harwood Mining Co., Limited, 25, Westgate Road, Newcastle-on-Tyne.	Harwood	Harwood, Middleton	Ditto.
Healey Field Mining Co., Healey Field, Castleside, Blackhill, Durham.	Healey Field	Healey Field	Ditto.

List of Mines classed under the Metalliferous Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Where situated.	Remarks.
	DURHAM—*continued.*		
Hexham and Edmondbyers Lead Mining Co., Limited, Blackhill, Durham.	Edmondbyers -	Swandale - -	Lead.
London Lead Co., Middleton-in-Teesdale (R. W. Bainbridge, Chief Agent).	Ashgill Head -	Middleton-in-Teesdale -	Ditto.
Ditto - - -	Bleagill -	Ditto - -	Ditto.
Ditto - - -	Bollyhope Burn or Yew Tree.	Frosterley - -	Ditto.
Ditto - - - -	Coldberry - -	Middleton-in-Teesdale -	Ditto.
Ditto - - -	Coldberry Skeers -	Ditto - -	Ditto.
Ditto - - -	Cornish Hush -	Frosterley - -	Ditto.
Ditto - - - -	East Rake - -	Middleton-in-Teesdale -	Ditto.
Ditto - - -	High Dyke - -	Ditto - - -	Ditto.
Ditto - - -	High Skeers -	Ditto - -	Ditto.
Ditto - - -	Little Eggleshope -	Ditto - -	Ditto.
Ditto - - -	Lodge Syke -	Ditto - - -	Ditto.
Ditto - - -	Red Groves -	Ditto - -	Ditto.
Ditto - - - -	Shambury or Flakebrigg.	Ditto - - -	Ditto.
Ditto - - -	Snaisgill -	Ditto - -	Ditto.
Ditto - - -	South Grain -	Ditto - -	Ditto.
Ditto - - -	Wager Burn - -	Frosterley - -	Ditto.
Ditto - - -	Whitfield Brow -	Middleton-in-Teesdale -	Ditto.
Ditto - - -	Wiregill - -	Ditto - -	Ditto.
Robinson, J. H., 25, Westgate Road, Newcastle-on-Tyne.	Isabella - -	Harwood Fell - -	Ditto.
Ditto - - -	Langdon - -	Langdon Beck - -	Ditto.
Ditto - - -	Martha - - -	Harwood Fell - -	Ditto.
Rookhope Valley Mining Co., Limited, East Gate, Darlington.	Stotsfield Burn -	Rookhope - -	Ditto.
Teesdale Mining Co., Limited, 25, Westgate Road, Newcastle-on-Tyne.	Teesdale - -	Harwood, Middleton-in-Teesdale.	Ditto.
Upper Teesdale Mining Co., Limited, 25, Westgate Road, Newcastle-on-Tyne.	Upper Teesdale -	Ditto - -	Ditto.
Walton, J. P., & Co., Acomb, Hexham.	Willy Hole - -	Ditto - -	Ditto.
Wolsingham Lead Co., Frosterley, Darlington.	Sunnyside (standing)	Wolsingham - -	Ditto.
	NORTHUMBERLAND.		
Beaumont, W. B., Allenheads, Northumberland.	Allenheads - -	Allenheads - -	Ditto.
Ditto - - -	Coal Cleugh - -	Ditto - -	Ditto.
Derwent Mining Co., Blanchland, Riding Mill.	Shildon (standing) -	Riding Mill - - -	Ditto.
	WESTMORELAND.		
Eden Valley Lead and Iron Mining Co., Kirby Stephen.	Longrigg (standing) -	Hartley - - -	Ditto.
Greenside Mining Co., Patterdale, Penrith.	Greenside - -	Patterdale - -	Ditto.
London Lead Co., Middleton-in-Teesdale.	Bayle Hill (standing)	Mallestang - -	Ditto.
Ditto - - -	Dufton Fell (do.) -	Appleby - - -	Ditto.
Ditto - - -	Hardshins (do.) -	Ditto - -	Ditto.
Ditto - - -	Hunter's Vein (do.) -	Ditto - - -	Ditto.
Ditto - - -	Lodgegill (do.) -	Ditto - -	Ditto.
Ditto - -	Mallestang - -	Ditto - -	Ditto.
Ditto - - -	Murton (do.) -	Ditto - - -	Ditto.

List of Mines classed under the Metalliferous Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Where situated.	Remarks.
	WESTMORELAND—*continued.*		
Nether Hearth Lead Mining Co., Limited, Dufton, nr. Alston.	Nether Hearth (standing.)	Dufton	Lead.
Pease, Henry, Stanhope Castle, Darlington.	Clouds (do.)	Kirby Stephen	Ditto.
Ditto	Hartley Birkett	Ditto	Ditto.
	YORKSHIRE.		
AD Lead Mining Co., Limited, Fremington, Richmond, Yorks.	Swinnergill, AD	Swaledale	Ditto.
Apedale Lead Mining Co., West Witton, Bedale.	Apedale	Redmire, Bedale	Ditto
Arkendale Mining Co., Arkengarthdale, Reeth, Richmond, Yorks.	Arkendale	Richmond	Ditto.
Beldi Hill Mining Co., Beldi Hill Mines, Swaledale, Richmond.	Beldi Hill	Swaledale	Ditto.
Bowman, John H., & Son, Wet Groves Mine, West Witton, Bedale.	Wet Groves	Askrigg	Ditto.
Charlesworth, J. C. D., Chapelthorpe Hall, Wakefield.	Grinton Moor (standing).	Township of Grinton	Ditto.
Ditto	Summer Lodge (do.)	Ditto	Ditto.
Ditto	Whitaside (do.)	Ditto	Ditto.
Denys, Sir G. W., Bart., & Co., Fremington, Richmond, Yorks.	Surrender AD (do.)	Swaledale	Ditto.
Drax, J. S. W. S. E., M.P., Holnest House, Sherborne, Dorsetshire.	Ellerton Moor (do.)	Reeth	Ditto.
Fell End Mining Co., Reeth, Richmond, Yorks.	Fell End	Ditto	Ditto.
Hurst Mining Co., Reeth, Richmond, Yorks.	Hurst	Ditto	Ditto.
Kirby, Thos., & Co., Keld Head Mines, Leyburn.	Keld Heads	Wensleydale	Ditto.
			Ditto.
London Lead Co., Middleton-in-Teesdale.	Baldersdale (standing)	Lunedale	Ditto.
Ditto	Lune Head	Ditto	Ditto.
Ditto	West Silverband	Ditto	Ditto.
Merrybent Mining Co., Melsonby, Barton Station, Darlington.	Merrybent (standing)	Melsonby	Ditto.
Old Gang Mining Co., Swaledale, Richmond, Yorks.	Old Gang	Reeth, Swaledale	Ditto.
Pease, Henry, Stanhope Castle, Darlington.	Sargill	Hawes	Ditto.
Ditto	West Burton	West Witton, Bedale	Ditto.
Scholefield, George, Egton, Grosmont, York.	Egton, Whinstone	Grosmont	Whinstone.
Waddington, G. W., 21, St. Hilda Terrace, Whitby.	Grosmont, Whinstone	Grosmont	Ditto.
Worton Mining Co., Bainbridge, Bedale.	Worton	Worton	Lead.

List of Mines classed under the Metalliferous Mines Regulation Act, &c.—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Where situated.	Remarks.
IRON ORE MINES.			
DURHAM.			
Weardale Iron and Coal Co., Tudhoe, Ferry Hill (J. C. Crone, Chief Agent).	Foul Wood (standing)	Rookhope, Weardale	Iron ore.
Ditto	Level Gate (do.)	Weardale	Ditto.
Ditto	Red Vein	Ditto	Ditto.
Ditto	Rowan Tree A. (do.)	Ditto	Ditto.
WESTMORELAND.			
Lake District Hæmatite Mining Co., Limited, Grasmere.	Fairfield (standing)	Grasmere	Ditto.
Muse, Straughton, Ashton, & Co., Grasmere.	Providence Iron Ore (standing).	Ditto Seat Sandle	Ditto.
SLATE MINES.			
WESTMORELAND.			
Field, Thos., Bangor Road, Leith	Kentmere	Staveley	Slate.
Elterwater Green Slate Co., Limited, Ambleside.	Elterwater	Langdale	Ditto.
Ditto	Thrang Crag	Ditto	Ditto.
Hodgson, P., & Co., Elterwater, Ambleside.	Banks	Ditto	Ditto.
Priestman & Co., Lowther, Patterdale.	Cawdle	Patterdale	Ditto.
Tyson, Wm., Elterwater, Ambleside.	Scott, Copy, & Lord's Quarry.	Langdale	Ditto.
FLAG STONE MINES.			
YORKSHIRE.			
Cradock, Hammond, West Witton, Leyburn.	Temple Scarr	West Witton	Yorkshire flags.
James, John, West Witton, Leyburn.	Penhill Park	Ditto	Ditto.
Metcalf, Richard, Burtersett Quarries, Hawes, Bedale.	Burtersett	Hawes	Ditto.
Metcalf, Thos., Seavey Quarries, Hawes, Bedale.	Seavey	Ditto	Ditto.
Robinson, Anthony, & Co., West Witton, Leyburn.	Penhill	West Witton	Ditto.
Rycroft, William, Whaw Slate Quarry, Arkindale, Reeth, Richmond, Yorks.	Whaw	Arkindale	Ditto.
Smith Bros., Gayles Quarry, Hawes, Bedale.	Gayles	Hawes	Ditto.
Smith, Joseph, Flag and Slate Quarry, Arkingarthdale, Reeth, Richmond, Yorks.	Cragg End	Arkindale	Ditto.

Report of Assistant-Inspector.

Chilton Moor, Fence Houses,
29th March 1879.

Sir,

In pursuance of Section 48 of the Coal Mines Regulation Act, 1872, and of Section 20 of the Metalliferous Mines Regulation Act, 1872, I have the honour to report that during the past year I exercised the duties of Inspector of Mines in the Durham District, which comprises the southern part of the County of Durham, the County of Westmoreland, and the North Riding of the County of York, and that in so doing I acted as assistant to and under the directions of Mr. Thos. Bell, the Chief Inspector for that district.

I have, &c.,
W. N. ATKINSON.

The Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department.

Mr. Hall's Report.

Report on the Inspection of Mines in the West Lancashire and North Wales Inspection District, from the 31st December 1877 to the 31st December 1878.—By Henry Hall, Esq.

Sir, Rainhill, March 27th, 1879.

As Inspector of Mines for the Liverpool district, comprising West Lancashire and North Wales, I have the honour to lay before you my report for the year ending the 31st December 1878.

Four hundred and thirty-one separate accidents have been reported during the year, and these have resulted in the death of 304 persons and injury more or less serious to 355 others. The separate fatal accidents have reached 102, as against 84 in the previous year, and have caused the death of 177 more persons, this large increase being due to the great explosion at the Wood Pit Haydock Colliery, in which 189 workmen lost their lives. The non-fatal injuries show a decrease of 179 in favour of 1878 as against 1877.

The quantity of mineral raised during the year amounted to 11,769,566 statute tons, an increase of 247,719 tons as compared with 1877. The coal trade of the district has been very depressed, and few of the mines have worked full time, but the workpeople have not suffered at all approaching the extent to which many engaged in other industries have been subjected.

The number of persons employed in and about the mines during the year has been 39,024, as against 40,342 in 1877, showing a decrease of 1,318. West Lancashire has employed 29,380, and North Wales 9,644. The quantity of mineral raised per each person employed in West Lancashire equals 322 tons, and in North Wales 237 tons. This apparent difference in individual efficiency appears from year to year, and it is difficult to fix the cause with any certainty. The coal itself does not appear to require more labour in cutting, but I believe the atmosphere of the Welsh mines is not kept as wholesome as it might be by brisker ventilation, and this may be a hindrance to energetic labour.

The following tabular statement shows the proportion of accidents and lives lost to the number of persons employed in and about the mines and to the quantity of minerals wrought during this year and for each previous year since the passing of the "Coal Mines Regulation Act, 1872."

	Persons employed in and about the Mines.	Tons of Mineral wrought.					Accidents.		Persons employed.		Mineral raised in Statute Tons.		Number of Mines.
		Coal.	Fire-clay.	Iron-stone.	Shale.	Total.	Separate fatal.	Lives lost.	Per separate fatal accident.	Per Life lost.	Per separate fatal accident.	Per Life lost.	
West Lancashire	29,380	9,427,572	47,060	1,474	—	9,476,106	76	273	386	107	124,685	34,711	—
North Wales	9,644	2,224,225	41,394	18,100	9,741	2,293,460	26	31	371	311	88,210	73,982	—
Totals and averages, 1878.	39,024	11,651,797	88,454	19,574	9,741	11,769,566	102	304	382	128	115,388	38,716	263
Do. 1877	40,342	11,426,745	70,334	23,811	957	11,521,847	84	127	480	318	137,165	90,723	301
Do. 1876	42,174	11,509,339	54,171	22,204	1,900	11,587,614	115	121	366	348	100,762	95,765	312
Do. 1875	45,186	11,398,032	40,430	20,151	2,352	11,460,965	111	129	407	349	103,252	88,845	313
Do. 1874	43,658	9,875,762	71,951	29,169	—	9,976,882	95	115	460	380	105,020	86,755	305
Do. 1873	42,300	10,288,583	41,121	46,896	—	10,376,600	101	125	418	338	102,738	83,012	273

The numbers of accidents and lives lost in each year approach each other very nearly, showing a gradual improvement in the quantities of mineral raised for each life lost, but from time to time a great explosion occurs, causing the years in which they take place to show a much higher death-rate; such has been the case during this year (see Wood Pit Explosion, 189 lives lost).

Lancashire and North Wales are far behind the other mining districts of the kingdom as regards immunity from accidents; this is due, no doubt, to some extent, to the much

greater depth at which the mines have to be worked; but this circumstance alone is not sufficient to account for the wide difference in results shown in the General Summary annexed to this report.

I believe the other causes which contribute to place this district in this unenviable position are chiefly the manner in which gunpowder is used, the custom of depending almost entirely on the colliers themselves to keep the working places safe, and the want of discipline and definite instruction as to the examination and use of safety-lamps. This subject is referred to again on pages 10 and 11.

The following statement shows the various kinds of accidents and the number of deaths caused thereby during each year since the passing of the "Coal Mines Regulation Act, 1872."

	Explosions.	Falls in Mine.			In Shafts.									Miscellaneous Underground.								On Surface				Gross Total.
		Falls of Side.	Falls of Roof.	Total Falls in Mine.	Overwinding.	Ropes and Chains breaking.	Whilst ascending or descending by Machinery.	Falling into Shaft from surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on surface.	Boilers bursting.	Miscellaneous on surface.	Total on surface.	
West Lancashire -	196	5	36	41	—	—	2	1	—	3	—	—	6	2	—	—	—	2	8	1	4	17	2	1	10	13	273
North Wales - -	8	6	7	13	—	1	—	1	—	1	—	—	3	—	1	—	1	2	1	—	—	5	—	—	2	2	31
Total in 1878 - -	204	11	43	54	—	1	2	2	—	4	—	—	9	2	1	—	1	4	9	1	4	22	2	1	12	15	304*
Do. 1877 - -	40	8	39	47	3	—	1	3	—	6	3	1	17	1	—	—	—	3	5	—	2	11	4	—	8	12	127
Do. 1876 - -	14	17	44	61	—	1	4	1	2	4	3	3	18	4	—	—	—	5	4	—	3	16	3	—	9	12	121
Do. 1875 - -	6	19	43	62	2	—	8	2	—	5	6	6	29	—	1	—	—	1	3	3	1	14	2	—	16	18	129
Do. 1874 - -	23	3	38	41	3	1	1	3	—	6	2	5	21	2	4	1	—	2	5	—	2	16	1	1	12	14	115
Do. 1873 - -	31	10	32	42	—	1	2	2	—	10	5	2	22	6	—	—	1	8	3	1	2	21	—	—	9	9	125

* Wood Pit Explosion.

Thus in this year 204 deaths have been due to explosions of fire-damp, 54 to falls of roof and coal, 9 to various kinds of accidents in shafts, 22 to miscellaneous accidents underground, and 15 to accidents on the surface, making a gross total of 304.

The annexed list shows the number and circumstances under which explosions of fire-damp have occurred, and shows five fatal explosions and thirteen non-fatal during the year.

List of Explosions of Gas in the West Lancashire District in the year ending December 31st, 1878.

Date.	No.	Name of Colliery.	Where situate.	Name of Seam.	No. Killed.	No. Injured.	Cause.
Feb. 17	1	Whiston -	Prescot -	Main Delf -	7	9	See full report. Cause "spontaneous combustion."
„ 21	2	Garswood Hall	Ashton-Wigan	Stone Drift -	—	1	This accident occurred in a tunnel which was being driven to prove the Orrell five-foot coal. A shot had been prepared and the place examined by the manager previous to its being lighted. The shot failed to do its work, but lighted a small quantity of gas which appeared to have been liberated by the shot. Cause "blasting with gunpowder."
May 14	3	Rainford -	St. Helens -	Seven Feet -	—	1	The fireman lighted a shot, when a small quantity of gas was in the place, which fired when the shot went off. The fireman was suspended for three months. Cause "blasting with gunpowder."

Date.	No.	Name of Colliery.	Where situate.	Name of Seam.	No. Killed.	No. Injured.	Cause.
June 7	4	Wood Pit -	Haydock -	Upper Florida	189	2	See full report. Cause unknown.
„ 19	5	Pemberton -	Wigan -	Pemberton, 5 feet.	—	4	After the fireman's examination, and previous to the men going to their work, a fall had occurred in the goaf, liberating some gas, which fired at the men's open lights, when they went into the place. Safety-lamps have since been adopted throughout the mine. Cause "open lights."
Oct. 26	6	Kirkless -	Wigan -	King Coal -	—	1	The man was clearing up an old road, and a small quantity of gas which had collected in a hole in the roof fired at his open light. Cause "open lights."
			Total in West Lancashire - -		196	18	

LIST OF EXPLOSIONS of GAS in the NORTH WALES DISTRICT in the year ending December 31st, 1878.

Date.	No.	Name of Colliery.	Where situate.	Name of Seam.	No. Killed.	No. Injured.	Cause.
Jan. 17	1	Wern - -	Bagillt -	Cannel -	—	1	A little gas had collected in a hole in the roof of one of the working places as the result of a fall, and one of the men in passing over the fall lighted the gas with his naked candle. He had been warned by the fireman not to approach the place. Cause "open lights."
Feb. 22	2	Brymbo -	Wrexham -	Yard - -	1	5	In driving a tunnel through a fault a small feeder of gas was given off, which was carried off in the ordinary way by the ventilation. The place had been visited by the fireman twice during the morning, and reported clear, but on one of the men going in later on, an explosion occurred, it is supposed from the gas giving off more rapidly. Open lights were being used. Cause "open lights."
May 4	3	Wern - -	Bagillt -	3 Yard -	—	1	The underlooker foolishly went into the goaf with an open light and fired a small quantity of gas. Special Rule 31 provides "that no person shall go into a goaf with an open light," and the manager therefore intimated his intention of prosecuting the man. Safety lamps are now being used. Cause "open lights."
„ 29	4	Bersham -	Wrexham -	Sinking Pit -	—	3	When within two or three yards of a seam of coal, the bottom was lifted up by the gas from below, which fired at the men's candles. Cause "open lights."

Date.	No.	Name of Colliery.	Where situate.	Name of Seam.	No. Killed.	No. Injured.	Cause.
May 30	5	Pendwll -	Wrexham -	Lower Yard -	6	11	See full report. Cause "not known."
June 26	6	Padeswood -	Mold - -	Main - -	—	1	A small "feeder" of gas was being given off from a fault and was seen by the fireman in the morning. He however cleared it away and the men commenced to work, using naked lights, although they had safety lamps with them. They left the place for a short time, and on returning to it went in with a candle instead of a safety lamp, igniting a small quantity of gas which had collected in their absence. Cause "open lights."
Jluy 22	7	Oak Pits -	Mold - -	Four feet -	—	2	The men went into their working place after an interval for changing, with an open light, and some gas which had collected there fired at the candle. Cause "open lights."
Aug. 27	8	Willow -	Buckley -	Main - -	—	1	The man was passing along a road with a candle in his hand, when he lighted a small "feeder" of gas which was coming from the floor. Cause "open lights."
Sept. 21	9	Brymbo -	Wrexham -	Main - -	—	1	The man lighted a small quantity of gas (with his naked light) which had collected in his working place during his absence from it for a few minutes. Safety lamps are now being used. Cause "open lights."
„ 29	10	Mold Argoed -	Mold - -	Main - -	—	1	After the men left their work at night, a little gas had collected in the place, which was fired by the open light of the injured man, who went into the place to get a shovel. Safety lamps are used at this colliery, except at the pit bottom, where the man was working, and in going to the place where the accident happened he broke the rules. Cause "open lights."
Dec. 7	11	Coed Talon -	Mold - -	Main - -	—	3	The gas was forced out of the goaf, by a fall, on to the naked lights of the men. The fireman had not discovered any gas previously. Safety lamps are now being used. Cause "open lights."
„ 17	12	Broughton -	Wrexham -	Main - -	1	2	The gas was liberated by a fall of roof in the working place and fired at the men's open lights. Cause "open lights."
„ 17	13	Hawarden -	Buckley -	Main - -	—	1	The man went into a place adjoining his own, and into which he had no business to go, and fired a small quantity of gas, which was being given off from a "fault." Cause "open lights."
			Total in North Wales - -		8	33	

No. 1.

WHISTON MAIN DELF.

Scale 100 Yards per Inch.

Henry Hall

REFERENCE.

D. *Door.*
S. *Stopping.*
Sand Stopping.
S.C. *Swinging Cloth.*
→ *Air Current.*
F. *Site of Fire.*
×1. *Position of burnt body.*
B. *Blown Stopping.*

1. *Abel Wall.*
2. *James Briscoe.*
3. *Isaac Anders.*
4. *John Donald.*
5. *James Mullaney.*
6. *Henry Heyes.*
7. *James Williams.*

} *Killed.*

WOOD
HAYDOCK C

Scale, 100 yar

PIT,

OLLIERY.

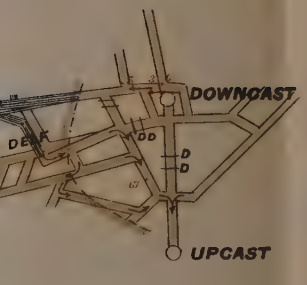
= 1 inch.

Henry Hall

No. 2.

Persons Killed.

1. John Molyneux.
2. James Higson.
3. Wm. Jameson.
4. See Ravenhead plan.
5. Wm. Winstanley.
6. Wm. Wilcock.
7. Thos. Winstanley.
8. Thos. Shaw.
9. Wm. Unsworth.
10. Jas. Leyland.
11. Jos. Hindley.
12. Hy. Waterworth.
13. Thos. Dixon.
14. Wm. Smith Senr.
15. Wm. Smith Junr.
16. John Evans.
17. Wm. Hindley.
18. Jos. Griffiths.
19. Jas. Barnes.
20. John Evans.
21. Hy. Waterworth.
22. Ed. Waterworth.
23. Robt. Rowland.
24. Evan Meredith.
25. John Hindley.
26. J. Rowley.
27. Enoch Booth.
28. John Hughes.
29. T. Pilkington.
30. Danl. Wilson.
31. Jos. Whittle.
32. Rich. Evans.
33. Thos. Clare.
34. J. Blimstone.
35. John Knowles.
36. Jas. Wild.
37. John Pilling.
38. Jas. Pierpoint.
39. Wm. Turnock.
40. T. Skidmore.
41. Ed. Evans.
42. Thos. Reed.
43. J. Fairhurst.
44. W. Fairhurst.
45. T. Whittle.
46. Jos. Norbury.
47. T. Waterworth.
48. M. Roach.
49. John Murphy.
50. Thos. Arnold.
51. Jas. Hindley.
52. P. Millington.
53. Wm. Cunnah.
54. Peter Nolan.
55. George Hales.
56. Jas. Clifford.
57. Wm. Dearden.
58. Jos. Dearden.
59. Wm. Mc Glynn.
60. Peter Roach.
61. Thos. Wood.
62. Thos. Mc Carty.
63. John Welding.
64. Robt. Hughes.
65. John Jones.
66. L. Lloyd.
67. Jas. Thomas.
68. D. Gittens.
69. Michl. Roach.
70. Jas. Lloyd.
71. Jas. Roberts.
72. John Evans.
73. Hy. Rowley.
74. John Jones.
75. John Edwards.
76. George Cunliffe.
77. Wm. Roberts.
78. Wm. Boon.
79. Isaac Boon.
80. Thos. Boon.
81. C. Redman.
82. John Jones.
83. Jas. Peake.
84. Job Swain.
85. John Boon Senr.
86. E. Richardson.
87. T. Thompson.
88. Hugh Wade.
89. John Cusic.
90. Jas. Fox.
91. John King.
92. Thos. Melling.
93. G. Green.
94. Peter Tyrer.
95. Jas. Twiss.
96. W. Jones.
97. Peter Hughes.
98. J. Pimblett Senr.
99. P. Sharples.
100. B. Nolan.
101. Wm. Leyland.
102. Jos. Twiss.
103. Jas. Owen.
104. Geo. Danks.
105. M. Fairhurst.
106. Sl. Winstanley.
107. J. Cotterall.
108. Robt. Ellis.
109. Wm. Owen.
110. Ed. Byrom.
111. Jas. Bibby.
112. J. Winstanley.
113. John Green Junr.
114. T. Pimblett.
115. T. Sharples Junr.
116. R. Ashcroft.
117. Geo. Morton.
118. Jas. Ashcroft.
119. Jas. Ashcroft Junr.
120. Jas. Whittle.
121. Wm. Carey.
122. Jos. Green.
123. J. Pimblett Junr.
124. Wm. Welding.
125. John Redford.
126. J. Greenall.
127. Jas. Dillon.
128. John Welding.
129. John Conway.
130. G. Powell.
131. Ed. Pimblett.
132. Jas. Lyon.
133. Ed. Rogers.
134. Robt. Rogers.
135. T. Sharples Senr.
136. J. Mc Govern.
137. John Jones.
138. Jas. Winstanley.
139. Michl. King.
140. Wm. Walpole.
141. M. Kelley.
142. Ben. Pilling.
143. T. Harrison.
144. G. Millington.
145. T. Stilwell.
146. John Turton.
147. Richd. Green.
148. Wm. Hughes.
149. Wm. Smith.
150. G. Swift.
151. John Swift.
152. Ed. Evans.
153. Robt. Evans.
154. T. Edwards.
155. Geo. Evans.
156. Jos. Johnson.
157. J. Johnson.
158. J. Jordan.
159. J. Williams.
160. A. Whittley.
161. Thos. Downs.
162. Nathan Boon.
163. John Boon Junr.
164. Wm. Cunnah.
165. J. Robinson.
166. R. Chorley.
167. W. Baines.
168. John Baines.
169. T. Burrows.
170. Jas. Gerrard.
171. Roger Banks.
172. C. Hughes.
173. Thos. Cawley.
174. Brien Lynch.
175. John Hayes.
176. Michl. Whalin.
177. Thos. Rowley.
178. Robt. Key.
179. Josh. Boon.
180. Ed. Twiss.
181. F. Molyneux.
182. John Roberts.
183. Ed. Manley.
184. E. Roberts.
185. C. Green.
186. Wm. Barnes.
187. Hy. Banner.
188. Jas. Shaw.
189. A. Gore.

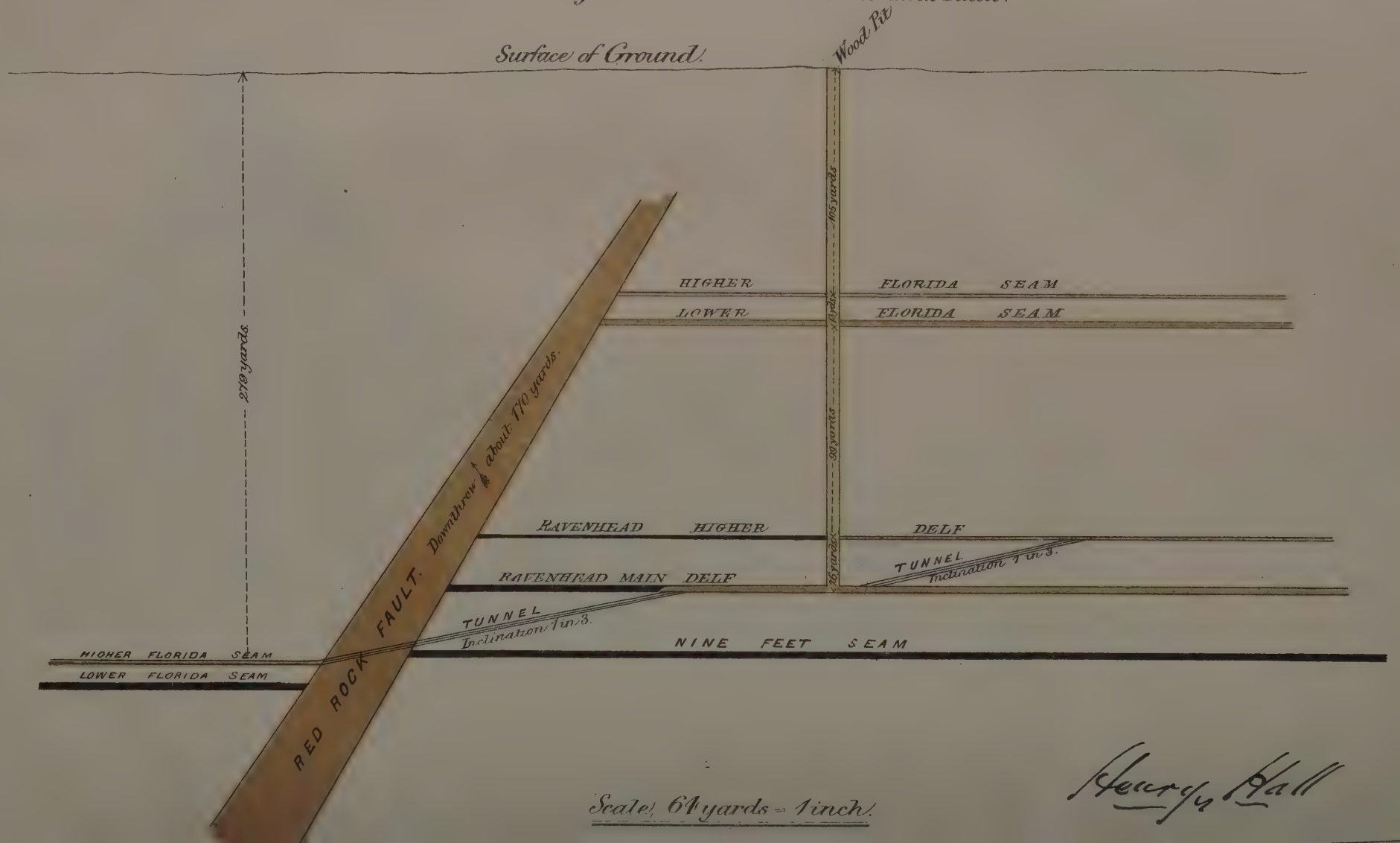


Dangerfield. Lith. 22 Bedford St Covent Garden.

No. 3.

WOOD PIT, HAYDOCK COLLIERY.

Section shewing Seams at each side of Red Rock Fault.

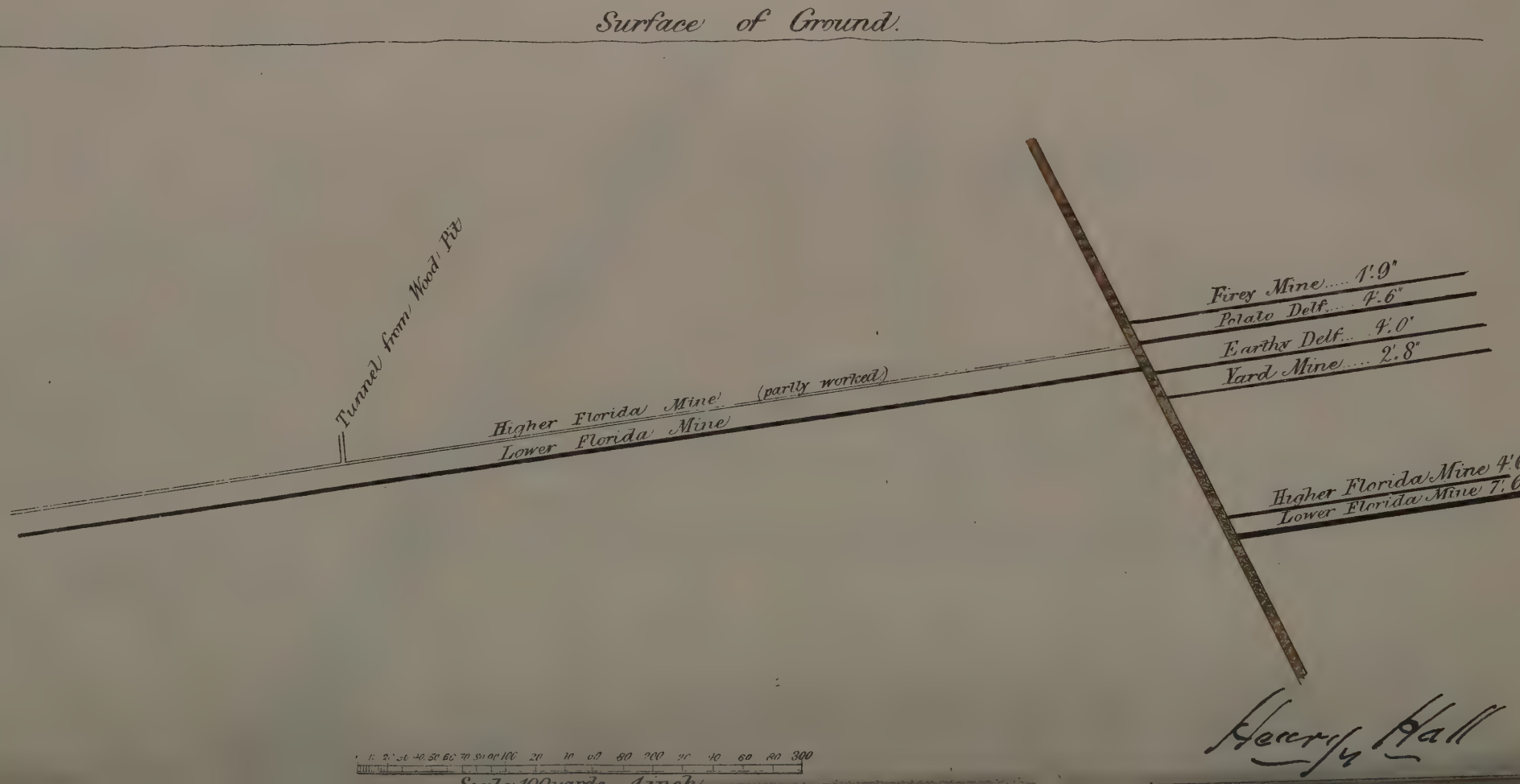


Henry H Hall

No 4.

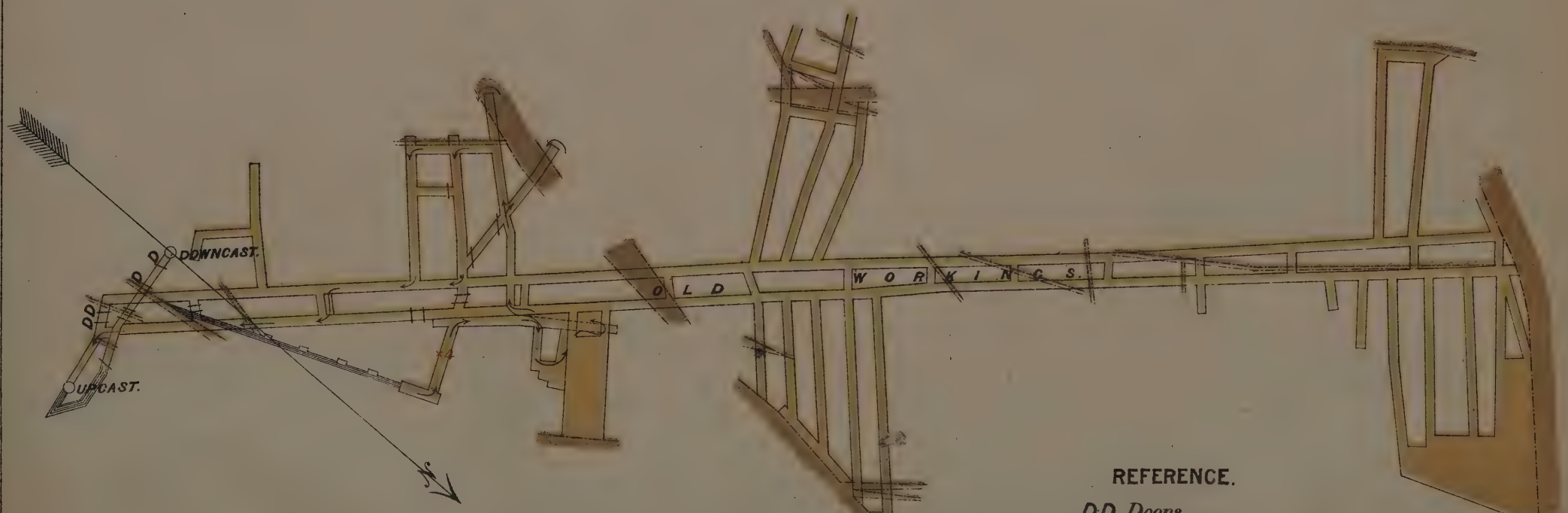
WOOD PIT, HAYDOCK COLLIERY.

Section of Upbrow in Higher Florida Mine on South Side of Red Rock Fault.



No. 5.
WOOD PIT, HAYDOCK COLLIERY.

Ravenhead Higher Delf Seam.



Scale 64 yards = 1 Inch.

REFERENCE.

D.D. Doors.

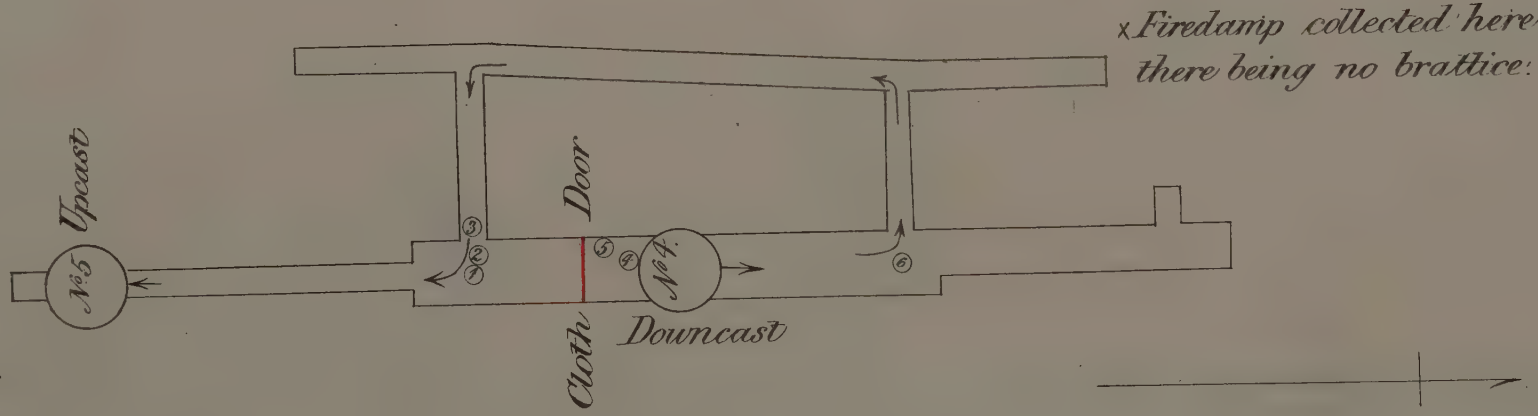
// Brattice Cloth.

Air Current.

×4. *Edward Sutton.*

Henry Hall

No 6.
FORSYGO PIT
BRYN MALLY COLLIERY.



Scale 9 yards to an inch.

No 1 David Edwards
" 2 John Davies
" 3 Richd Powell
" 4 John Powell
" 5 Ishl Davies
" 6 Jos. Millington

Persons killed.

Henry Hall

Of the fatal explosions, number 1 (Lancashire) occurred on Sunday the 17th February at one o'clock in the afternoon. At this hour the barometer registered 30·00 inches (per Chadburn's self-registering bar at Liverpool).

This explosion caused the death of seven persons and injury to several others, and was caused through spontaneous combustion in the mine. The seam had been liable to fires from this cause for some years, and they were dealt with by isolating the district of the mine where they broke out, by putting in sand and brick stoppings, and workmen were engaged at this work when the accident happened. Three years ago, when my attention was drawn to the fact of fires occurring in this mine from spontaneous causes, I suggested that advice should be sought as to the best and safest method of dealing with them, and at that time upwards of 20 of the leading mining engineers of the district were called together by the owners of the colliery, and it was determined to adopt the plan of stoppings above referred to.

At the inquest as to the cause of this accident the certificated manager (Mr. Makinson) gave evidence as follows:

"That he had been in charge of all the pits of the Wigan and Whiston Colliery Company for 10 years. On Sunday the 17th February, about one o'clock in the afternoon, Abel Wall, who was one of the firemen, reported to him that there had been an explosion from the stopping in the Main Delf Mine No. 1 pit. He consulted with Wall as to the best manner of shutting off the air more effectually, and three more men were got to work. They had the plans before them, and having decided on their operations, witness gave orders for men to work whilst he looked after sand and other materials. He went down at once, but returned directly for the materials. He descended about half-past two o'clock, taking William Jones, the furnaceman, with him. The men were at work at the stopping, and he continued taking sand for them. There was some delay in clearing the roads, and after they had got the first two boxes of sand up the jigger-brow using full boxes of coal for a balance, as he was returning to the foot of the brow, there was an explosion coming from the brow, but he saw no fire. He was knocked about by the wind from the explosion coming down the brow, and his light was blown out. He got a light at theoffice at the bottom, and asked the firemen Corrighan and Clough to go with him to the top of the brow. In the jigger-brow they first met Howard making his way out; he was much burned, and the other men took him out whilst witness went forward and met three more men coming out without lights. A little higher up he met three others, and took them to the eye of the pit. He asked Corrighan and Clough to go with him to the top of the brow again, and they went to within a short distance of the stopping the men had been making. Another explosion then occurred, coming apparently from the stopping, and he saw fire. He found himself down under a lot of timber. He got free, and went as well as he could to the pit-eye and was taken to the surface. The other men who were injured had been taken up before him.

"It was about three years since they first knew of fire in these old wo kings. The fire was confined to these and such places as they could not gain access to, and it arose, he believed, from spontaneous combustion. They at once took steps to shut off the ventilation from these workings and had continued to do so. Indications had occurred from time to time of the fire continuing there, and there had been explosions from time to time, but since the first two they had not been of any consequence."

In reply to Mr. Hall: "This fire had been burning for about three years in various places; there had been five or six different districts on fire slightly, and those had been stopped off effectually. On Sunday morning the usual time for firemen to go down was between half-past seven and eight. We always made a practice, when places were abandoned, to exclude the air from them, and all the stoppings were put in with that object. I remember a consultation being held in the colliery office in September 1875 when a lot of mining engineers were brought together to consult on this very subject. I remember the conclusion was that we should try to effectually shut off the air at the intake, and if it was not quite right at the outlet where the gas empties itself, we were to allow the gas just to escape through a small hole. I know the conditions made at that time were that at the time of fire no one but those employed at the stoppings should be in the mine. I remember the engineers instructed that in putting in the stoppings, open spaces behind should be avoided as far as possible. Whenever there was convenience to make a good stopping we did it. Abel Wall pointed out all such places to me. A week or so before this occurred we were talking about the stoppings being right, and he said they would be sure to be right."

Several other witnesses gave evidence to the same effect. I also gave evidence as follows:—

"He heard of the explosion on Sunday night, soon after it occurred, and went at once to the colliery. He was familiar with this mine, more particularly because two years ago a similar explosion occurred, fortunately not attended with loss of life, and it became a question

then to decide what was best to be done with the fires caused by spontaneous combustion, which this pit was liable to. At that time about 20 of the best mining engineers of the district were brought together by Mr. Fidler, managing director, to ascertain their opinions as to the best course to be adopted. Their advice was that sand should be used for stoppings, and that they should be put in in such a position as would avoid any open space behind them in which fire-damp might collect, and that while such work was being done the ordinary working of the mine should be discontinued. Beyond what was thus arranged there was a rule in the Act of Parliament which particularly applied to a mine under these conditions, viz., that when danger was found to exist no one is allowed to work in the mine except those engaged in endeavouring to remove the danger. In the present instance all the men who were in the pit at the time of the accident were engaged in removing the danger, which was quite in conformity with the law on this particular point.

"The questions that seemed to arise were, whether proper care was taken to put the stoppings as near to the face as they could be got. If the jury were satisfied with what had been done in this respect he was content. Another question was whether the men who went to work at the stoppings on Sunday should not have been more directly warned of the great danger of the work they were going to do. The manager knew, and every official must have known that it was extremely dangerous work, though he must say he believed they would have gone just the same, and the result would have been just the same."

The jury returned a verdict as follows:—"That the deaths were caused by accident, and "they considered the manager and all connected with the colliery were deserving of praise "for the efforts they made to put out the fire and save life."

The circumstances of this accident, and the evidence generally, showed that all ordinary and reasonable precautions had been taken by the manager of the mine, and that honest endeavours had been made to carry out the recommendations of the engineers, whose advice had been taken as to the safest means of working the colliery.

There was no breach of the Act of Parliament, the persons in the mine at the time of the accident being confined to those engaged in removing the danger. Under these circumstances no prosecution or inquiry as to the conduct of the manager was called for. The owners have since abandoned the working of this mine, involving a considerable pecuniary sacrifice rather than run the risk of the recurrence of a similar accident.

A plan of the workings is annexed.

No. 4 (Lancashire) explosion of fire-damp occurred on the 7th June at the Wood Pit of the Haydock Colliery, the property of Messrs. Richard Evans & Co., and caused the death of 189 persons. It happened a few minutes after 11 o'clock a.m., barometer registering 30·05 inches, having commenced to fall at 9.0 a.m. the same day, and was still falling at 11 o'clock.

Plans of this mine are annexed, and details of the circumstances have already been submitted to you, together with reports by Mr. Maule, Q.C., and myself on the evidence adduced at the inquest, which was opened before Charles E. Driffield, Esq., county coroner, and occupied six days. Mr. Maule was present at this inquiry, and I acted in concert with him, and took care that every witness was produced who was likely to throw light on the causes of the accident, and endeavoured by cross-examination to bring the whole of the circumstances under the observation of the jury, and at their request I gave evidence as follows:—

"July 1878.

"I have made frequent inspections of this Wood Pit since the accident, and have assisted in the work of exploration, being accompanied on several occasions by Mr. Dickinson, the inspector for North-East Lancashire and Ireland, and also by Mr. Hedley, assisting inspector in this West Lancashire district. These inspections commenced on Sunday the 9th of June, and ended on July 3rd. The Wood Pit is one of a group of pits which form the Haydock Collieries. It is sunk to a depth of 243 yards, passing through four seams of coal, viz.: The Higher Florida, at 105 yards; Lower Florida, at 118 yards; Ravenhead Higher Delf, at 217 yards; and the Ravenhead Main Delf, at 243 yards. At a distance (78 yards) from the Wood Pit, which is 10 feet diameter, is a second or upcast shaft 9 feet diameter, from the surface to a depth of 118 yards, and below that it is widened out to 10 feet diameter. The Higher Florida mine, in which this explosion occurred, is reached by an incline tunnel 190 yards in length. This tunnel strikes the seam at the south side of a large down-throw fault called the Red Rock fault, which has cast the Higher Florida seam down to a lower level than that at which the Ravenhead Main Delf is found at the bottom of the shaft. From inquiry I find that on the day of this explosion, the 7th of June, there were 190 men and boys engaged in the Higher Florida workings beyond the fault, and 60 or thereabouts in the other seams at work near the shaft, inclusive of one or two engaged in the tunnel itself. From inquiries I find that the explosion occurred at a few minutes after eleven o'clock in the morning, smoke and dust issuing out of both shafts. The barometer at this time stood at 30 1-20 inches, having, according to Chadburn's self-registering barometer in Liverpool, commenced to fall slowly at nine o'clock the

same morning, and was still falling at eleven. Mr. Turton, the certificated manager, who was on the pit bank at the time, at once descended the mine, and several men were rescued by him, with the assistance of others who were soon on the spot. Since that time explorations have been pushed forward with all speed, and up to to-day 189 bodies have been recovered. It is still thought that one person yet remains in the mine, and explorations still continue. The ventilation of the mine has been fairly described to you by Mr. Turton. He states the total quantity passing down this pit to have been 50,350 cubic feet per minute, distributed in the different seams as follows, viz.: Ravenhead Main Delf, 13,050 feet per minute Ravenhead Higher Delf, 11,800 feet per minute; Lower Florida and Upper Florida mines, 20,500 cubic feet per minute. If you accept the correctedquantities as explained by Mr. Chadwick, they stand as follows, viz.:—Ravenhead Main Delf, 17,124 feet per minute; Ravenhead Higher Delf, 16,117 feet per minute; and Upper and Lower Florida mines, 28,000 cubic feet per minute. The small scale of air passing through the Lower Florida mine does not materially affect the main current passing into the Upper Florida mine. It is a pity the anemometer was not kept in proper condition and daily records of ventilation entered in a book The portion going to ventilate the Higher Florida mine passes down the main tunnel, which has an average area of about 75 square feet; it is then led into two intakes, each having an average area of 50 square feet, and travels up brow a distance of 500 yards, and first visiting Kay's place, being led to that point by brick stoppings, with the exception of the openings where coals are passing out, at which points either wooden doors or canvas are fixed. The air then passes along the edge of a small goaf or old working, which, with the small goaf below Kay's place, amounts to half a Cheshire acre. The same air then passes on and visits the men in the whole or fast workings, and afterwards round the slant broken workings and home to the bottom of the tunnel, passing up a ten-feet staple pit and into a main return, having an average area of 50 square feet, and then over an open furnace up the upcast shaft. This Higher Florida ventilation passes round the whole of the workings in one course, visiting in all 53 working-places, and travelling a distance of 4,300 yards. The whole of the persons employed in the Florida seam beyond the fault, the seat of the explosion, were using locked Davy lamps, with the exception of two or three locked clanny safety-lamps used in the main intake at special points. There were also some open gaslights at the bottom of the downcast, but in the main intake. Blasting with gunpowder was not practised in this seam, neither in coal or in stone work, and no shot has been fired there during the last 18 months. I have examined the mine as to signs of the blast, and find that the force of the explosion has extended from the neighbourhood of Pilkington's place in the up-brow workings downwards to the bottom of the incline tunnel, and from south to north in the neighbourhood of Baines's place, being very decided in and about Baines's place and the working-places below, the brattice-cloth being blown to pieces, and in some cases the trams are blown to pieces. The whole of the workmen in the up-brow workings have been killed instantly by the blast, all being found at their working-places, with the exception of six men in the neighbourhood of Holding's level. The slant-workings have escaped the blast, but the men engaged there have been suffocated by the after-damp, the product of the exploded fire-damp in the up-brow workings, most of whom had made an effort to escape, and were found some distance from their working-places as shown on the plan. It appears from the evidence that for some time previous to the explosion fire-damp had been noticed at the edge of the goaf or old work near Pilkington's place, and it was sometimes found in the working-places themselves. It is not unusual to be able to detect fire-damp at the edge of a goaf even where the ventilation is brisk, but when this fire-damp extends back into the working roads it is a sign either that the means of ventilation are insufficient or that the airway along the edge of the goaf is too contracted, and so the air is driven to take the lower opening. It also appears from the evidence that fire-damp was seen for several days together in Baines's place, and also in the up-brow driven out of this. There were very long lengths of brattice in these two places, in one case 80 yards, and in the other about 76 yards. Under such conditions it would be more than likely that fire-damp would collect. This amount of bratticing would have been unnecessary had proper care been taken that the drivings should advance conjointly, so as to secure holeings at shorter distances. Fire-damp has also been mentioned as occurring down the slants, but the explosion has not originated there, nor does it appear even that it has extended to that part of the mine except as after-damp. The men who were found at A. on the plan, part-way down the slants, had brought their lamps with them, an evidence that the force exerted at this point had not even blown their lamps out. Judging from the evidence already referred to, and from what I have seen in the mine, I am of opinion—first, that this explosion originated at or near Evans's place, and that it came in contact with more fire-damp and had its force increased at or near Baines's place; second, that the fire-damp that ignited in the first instance was forced out of the goaf by falls (probably caused by drawing timber) into a too weak current of air, and locally fouling this current, came in contact in an explosive condition with some defective or injured lamp. Any fire-damp that may have been resting at this time at or about Pilkington's goaf would seriously increase the disastrous effects of the explosion. I consider the method of leading the ventilation in one continuous current over such a long distance and past the edge of a goaf giving off fire-damp, and in which falls of roof in the natural course of working frequently take place, and thence to workmen engaged in the new openings, showed a sad want of skill on the part of the management. The weakness of this system of ventilation was constantly made evident by the fire-damp frequently extending back into the working-places as spoken of by several witnesses. That knowing the goaf was charged with fire-damp it showed a want of precaution to allow timber to be drawn whilst the ordinary work of the mine was going on, because heavy falls of roof would occur, and would be likely to drive gas out into the roads. That 28,000 cubic feet of air per minute was an unusually small quantity of air to keep a mine safe in which 200 persons were at work, and where the seam was much broken up by faults, and it was likely to cause great difficulty to the under-officials in

their attempts to keep the men's places clear of gas. This difficulty does appear actually to have arisen, judging from the evidence we have heard; and this being so, prompt measures should have at once been taken to largely increase this quantity of air. The regulations of the colliery in other respects have been satisfactory, and there has been no want of discipline. A good deal has been said about a sudden outburst of gas. It is possible that this may have occurred; but keeping in view the evidence that has been given by workmen witnesses, I am strongly of opinion that the fire-damp draining from the upper goaf into a weak ventilation, and this issue of fire-damp being temporarily increased by the roof falling where the coal had been got, was the real source of the accident. I should have expected Mr. Chadwick, the resident viewer, and who takes the general direction of the collieries, to have seen that the means and system of ventilation was such as would give the under-officials the opportunity of keeping the working-places of the mine in a satisfactory condition. The workmen witnesses who speak to having seen fire-damp in the mine, do not appear to have given information to any person of higher authority than a fireman. It was their duty, if the danger continued, to speak to the manager, and if he failed to apply a remedy they should have made it known to me."

After a full and careful inquiry, the jury returned the following verdict:—"We believe "there has been a fouling of air connected with an outburst of gas or fall of roof, but by "whom the gas was ignited there is no evidence to show. The explosion was caused by a "faulty ventilation, and by an accumulation of gas in goaves near Evan's place, which has "been expelled from thence by a fall of roof, and assisted by other fouling which was known "to exist, previous to the explosion, by firemen and others."

The jury added the following recommendations:—"There should be two firemen's reports, "one for each 'shift,' and that the ventilation should be in future carried out according to "the wishes of the Government Inspectors. The jury think the lamp system good, but "requires better supervision, especially that the machine to fasten the lead rivets should not "be left carelessly in the mine."

In consequence of the report of Queen's Counsel on the evidence adduced at the inquest, an inquiry was ordered under the 32nd section of the "Coal Mines Regulation Act, 1872," as to the conduct of Mr. John Turton, the certificated manager of this Wood Pit.

This inquiry was held in Liverpool on the 24th September, and two following days, before Thomas Stamford Raffles, Esquire, stipendiary magistrate, assisted by G. C. Greenwell, Esquire, mining engineer, as assessor.

Mr. Turton was charged as follows:—

"1. On the 7th day of June 1878, the said John Turton was, and for many years previous to that date had been manager of the Wood Pits at the Haydock Collieries, situate at Haydock, near Wigan, in the county of Lancaster.

"2. On the said 7th day of June 1878, at about eleven o'clock a.m., an explosion of gas occurred in a seam of the said Wood Pits, known by the name of the Higher Florida Mine South, by which explosion 189 men out of about 200 there employed in the said mine were killed.

"3. The supply of air sent into the said mine was far below the amount required for the wants of the men (200 in number) and horses (11 in number) in it during the day shift, and for effectually clearing out the working-places, 53 in number.

"4. Such supply of air had to travel too great a distance, by reason of which it encountered a resistance from friction when driving forward so long a column of atmosphere, whereby the ventilation was weakened.

"5. The system in vogue in the said mine of sending the air in its early course along the skirts of the goaves on the rise side of the said mine, from whence it was carried to the men employed in straight workings, was calculated to convey gas to such men, and so was a faulty system of ventilation.

"6. Too many working-places had previous to the said explosion been laid out and kept going, at one and the same time, for the thorough ventilation of them all, whilst some of them had been taken forward too far in advance of others.

"7. On the date of the said explosion, from the causes mentioned in paragraphs 3, 4, 5, and 6 hereof, or from other causes, an adequate amount of ventilation was not constantly produced in the said mine to dilute and render harmless noxious gases to such an extent that the working-places of the shafts, levels, stables, and workings of the said mine, and the travellings roads to and from such working-places, should be in a fit state for working and passing therein as provided by the 1st general rule laid down in the 51st section of the said Act.

"8. In consequence of the several allegations and reasons above appearing, or some of them, the said John Turton is, by reason of incompetency, unfit to discharge his duties as such manager.

"9. In consequence of the several allegations and reasons above appearing, or some of them, the said John Turton is, by reason of gross negligence, unfit to discharge his duties as such manager."

The result of this inquiry was that the magistrate handed back to Mr. Turton his certificate, on the ground that no evidence had been adduced to lead him to believe that it ought to be forfeited.

It appeared from the evidence that Mr. Chadwick, the agent of the mine, and holding a superior position to the certificated manager, was to some extent responsible for the system upon which the mine was worked, Mr. Turton being in the habit of consulting him on all important matters, but to what extent such an arrangement would lessen the certificated manager's responsibility, or if at all, I am not able to say.

It also appeared at this inquiry that an outburst of gas or fire-damp had taken place in the particular district of the mine which had been unanimously fixed upon by the witnesses at the coroner's inquest as the point where the explosion had originated. Between the coroner's inquiry and the Liverpool inquiry, excavations had been made in the mine which showed that an outburst had occurred and was still continuing in the district referred to.

With the knowledge that an outburst of fire-damp did occur at or about the time of the explosion, it would be unreasonable to assume that it did not play the chief part in bringing about this explosion, but I am still of opinion, as expressed at the inquest, that the system of ventilation was bad, and the quantity of air (28,000 feet per minute) was an unusually small quantity of ventilation to keep a mine safe in which 200 persons were at work, and was likely to prove a fatal error in the case of any sudden increase of fire-damp, either from blowers or forced out of the goaf by falls of roof.

I deem it to be my duty at every inquiry into the cause of mining accidents to point out as far as possible the whole of the circumstances which appear to have led up to such accidents and whether such circumstances point to a breach of the Act of Parliament or not, with the object of preventing similar accidents in the future, and I believe that the steps which have been taken in reference to this explosion will prove very beneficial throughout the district, and that they have not pressed unjustly on the officials connected with the management of the Wood Pit.

The whole of the dependent relatives of the workmen who lost their lives in this sad catastrophe have been liberally provided for by public subscription. The sum raised for this purpose amounted to upwards of 26,000*l.*, and the number of recipients is 308. This handsome provision was secured by the efforts of the leading residents in the district of Newton-le-Willows. Messrs. Evans, the owners of the colliery, subscribing 3,000*l.*, and their workpeople 590*l.*

No. 5 (North Wales), fatal explosion of fire-damp occurred at the Forsygo Pit of the Bryn Mally Colliery, near Wrexham, the property of Thomas Clayton, Esq., and resulted in the death of six persons and injury to several others. The accident occurred between 5 and 6 o'clock a.m. on the 30th May. Barometer 30.15 (per Chadburn's self-registering bar at Liverpool.)

By your instructions, Mr. Maule, Q.C., was present at the coroner's inquiry in reference to this accident, and a report of those proceedings has already been submitted to you. The evidence pointed to insufficient ventilation, and, with your approval, proceedings were taken against the certificated manager for a breach of No. 1 General Rule.

The case was heard at Wrexham before the county magistrates, and occupied three days. The evidence of the prosecution went to show that fire-damp had been found in the "face" of certain "workings" on several days previous to and on the morning of the explosion; thus there seemed to be a *primâ facie* breach of the said rule, and we also held that *reasonable means* had not been used by means of "bratticing" to avoid these accumulations of fire-damp.

The magistrates took every pains to have the whole of the facts before them, and finally dismissed the case, saying, they were willing to believe that there had been a sudden outburst of gas, and that they thought the responsibility and duties of the manager of a colliery were not defined with sufficient strictness by the Act of Parliament.

The verdict of the coroner's jury was as follows:—"That the six deceased colliers lost their "lives in consequence of an explosion of gas in No. 4 pit, Forsygo, but that they were not "satisfied with the evidence as to how the gas was ignited." The jury also recommended "that more attention should be paid to the system of 'bratticing,' which they considered "was somewhat defective."

A plan of this mine is annexed, and the following evidence given by Mr. Hedley, the assistant inspector, will, I think, explain it in every particular.

"Mr. John L. Hedley, assistant inspector of mines for West Lancashire and North Wales, said, on the 30th May he, in company with Mr. Hall, made an examination of the lower yard

seam, where the explosion occurred, at a depth of 174 yards from the surface and 13 yards from the main coal. The lower yard seam had only just been opened out, and the workings were limited. The upper level, which had been driven with thrillings into the lower one, was got through the day previous to the explosion. The upper level had been continued without the thrillings, and in consequence of the bratticing being neglected, gas had accumulated at the face of the north opening, in removing which, by the reprehensible practice of brushing, the explosion occurred. It appeared that gas had been reported daily for some considerable time, and yet no proper means had been taken to prevent such accumulations. The practice of the brushing out of gas could not be too severely condemned. The mine was worked with locked Clanny lamps, the only open light used in this pit at all being in the upcast main seam. The lamps, it appeared, had been all tested, and found safe, and the gas could not have been fired by any of them unless one or other was opened. The fact of the gas being there and having exploded was not so important as how the gas had accumulated in the mine, and this was caused, no doubt, by the imperfect ventilation, which should be led into the facings by brattice-cloths. Had the Act of Parliament been strictly adhered to and carried out with regard to ventilation, the accident would probably never have occurred; and had the 15th rule of the colliery under the Mines Regulation Act been acted upon, the accident could not have happened, viz., the rule requiring that any fireman on finding inflammable gas in any part of the mine in sufficient quantities to render that part of the mine, in his opinion, dangerous, shall at once withdraw all workpersons from that part of the mine."

During the year there have been 19 fatal and non-fatal explosions of fire-damp within this district; six occurring in Lancashire, and 13 in North Wales. Full particulars of each of these explosions, both as to dates and their causes, are given on the list annexed hereto; and from analysis of these it appears that the direct cause is usually either "open lights" or "blasting with gunpowder," the primary cause in each instance being the failure of the ventilation to avoid accumulations of fire-damp.

Now it is quite clear that the two first of these causes can be removed by legislation, but the third and primary cause it is perhaps impossible to entirely remove. In previous reports I have strongly advocated the strict use of safety-lamps in all mines subject to fire-damp, and that the use of gunpowder should be restricted to those intervals when the ordinary work-people are out of the mine.

It may be of interest to note that recently in the town of Preston two explosions of gas occurred under the following circumstances: A subsidence of the pavement took place from some cause and broke one of the gas mains, causing an escape; and whilst men were busy repairing the damage, the escaped gas was lighted by sparks caused by one of the workmen's picks striking against hard stone. This occurred a second time shortly afterwards whilst similar work was being done.

It is generally held that the carbureted hydrogen gas of mines is more difficult to ignite than ordinary illuminating gas, but I think there is a fear that where mine gas is given off comparatively pure, it may be as easily ignited.

In consequence of the constant recurrence of accidents during the year, I thought it might be of benefit to draw the attention of the managers of mines by circular letter to certain matters which appeared to need more attention. The following is a copy of the circular issued.

RAINHILL, PRESCOT,

_____ 1878.

West Lancashire and North Wales Mines Inspection.

SIR,

In consequence of several serious accidents which have occurred in this district, I desire to draw your attention to the necessity of greater care and precaution in the use and examination of safety-lamps.

"Davy" safety-lamps should be provided with a proper shield to avoid as far as possible any danger of flame being forced through the gauze.

When making the daily examination of safety-lamps as required by No. 7 General Rule, the aguze should be withdrawn from the frame of the lamp in every case, so that the examination may extend to every part; unless this is done, such examination cannot be thorough and effective.

If glass lamps are used the examiner should not pass any cracked or chipped glasses.

The fireman of each district of the mine is the proper person to examine and securely lock all lamps before they are taken beyond the "lamp station." All such "lamp stations" should be distinctly indicated by a notice board with the words "lamp station" kept legibly printed upon it.

At collieries where it is the practice to examine and lock the lamps on the surface, the duty should only be entrusted to an intelligent and careful man, and be thorough and complete as already pointed out.

All lamps should be numbered and constantly used by the same workman, the numbers being entered in a book against the owners' names. Where the lamps are the property of the workmen, a small numbered "token" should be attached to each lamp, and a record kept of these "tokens," with the object of readily identifying the owner of any lamp which has been tampered with.

The ventilation should be frequently recorded in a book.

I also take this opportunity of drawing your attention to the following matters:

First. That the firemen's reports under General Rule No. 2 should distinctly state the condition of the mine, in addition to an expression of opinion as to its safety or otherwise.

Second. That stemmers used under General Rule 8 should, if possible, be made entirely of wood, or a combination of wood and copper. If iron with a copper tip is used, the tip should be at least six inches in length and should be examined and stamped with the name of the colliery or other mark.

NOTE.—*Several fatal accidents have occurred recently through the workmen introducing and using iron stemmers with very short copper tips.*

Third. That under special Rule 28 (North Wales) and 40 (Lancashire), it is compulsory on the workmen to set sprags as soon as there is room in all cases, and to keep them set during holing; and a place being apparently quite safe is no excuse for their not being set.

Fourth. That under the Elementary Education Act, 1876, all boys under the age of fourteen years, and employed either underground or on the surface, must attend school in accordance with the byelaws of the local school authority, unless they possess a certificate of previous due attendance at school, or a certificate of proficiency, or unless they had attained the age of eleven before the 1st January 1877.

Your obedient Servant,
HENRY HALL,
H. M. Inspector of the District.

Falls of Roof and Side.

There are 54 deaths to report under this head. Accidents of this description are much more frequent in Lancashire than in other mining districts on account of the great depth at which the mines are worked, and also to the system of timbering adopted. In this district the miners themselves carry out the timbering of the working-places, and in many instances the supply of timber for the purpose is not placed as conveniently as it might be, and thus the men are sometimes tempted to postpone fixing it.

A great number of workmen employed as daymen in repairing the roads and levels underground have met with accidents through falls of roof. I believe these accidents are more frequent here because it is not the custom to employ a chargeman or skilled foreman to supervise and direct.

No. 16 General Rule refers to this subject and enacts "the roof and sides of every travelling "road and working-place shall be made secure, and a person shall not, unless appointed for "the purpose of exploring or repairing, travel or work in any such travelling road or working-"place which is not so made secure." This rule throws the whole responsibility on the owner and manager of seeing that the working-places and travelling roads are kept secure. They may employ miners or whoever they please to do the work, but they must by proper supervision see it securely done. Such supervision should consist of at least two visits to each workman during a "turn" by a fireman or other competent person, and by constantly providing suitable timber in each working-place ready for use. They are bound also to enforce No. 40 Special Rule (Lancashire) and No. 28 (North Wales) which requires the workmen to set sprags, &c. If the workman himself will not use common prudence, the most perfect supervision on the part of the officials must fail.

Many of these accidents from "falls" arise through "slips" in the roof which are difficult to detect and guard against. In a mine liable to these "slips" systematic timbering should be enforced, that is, timber should be placed at fixed intervals without reference to the appearance of the roof, and at all dangerous points additional timber used.

Accidents in Shafts.

Nine deaths have been due to this cause, six of which are persons falling into shafts from the surface or from mouthings part-way down. At first sight it seems strange that men do not avoid accidents of this kind, but when we remember how difficult it is to distinguish one object from another in the semi-darkness of a mine, a reason at once appears. I believe that the most careful man employed for any length of time hanging coals on at an ingate part-way down a shaft, and where the fencing is so arranged that it has to be entirely

removed whilst the work is being done, will eventually fall into the shaft. (NOTE.—The Act of Parliament allows such removal of fencing.)

There are no accidents to record this year from over-winding.

Miscellaneous Accidents Underground.

There are 22 deaths to record under this head, just double the number for last year. Most of these have occurred in passing the coal from the "face" to the "shaft." Roads for this purpose should be kept a sufficient height and width, and proper attention paid to the refuge places required by No. 10 General Rule. I have noticed some want of attention to these refuge places, and the next case that comes under my notice I will ask your sanction to proceedings being taken.

Many of these accidents are caused by the workmen's own want of care for their fellow workmen, such as omitting to use sprags in lowering trams on inclines; others such as ropes breaking and men and boys being struck by projecting timber and roof whilst riding to or from their work show a want of careful supervision and forethought on the part of the management.

Accidents on the Surface.

Fifteen deaths have been due to this class of accident, eight of which have happened in moving waggons about the screens and on railway sidings. In some instances accidents have been caused through engine-drivers omitting to sound their whistles at level crossings and when running waggons into sidings. Nearly the whole of the accidents on the surface are caused by the workmen's want of care of each other.

General Remarks.

Four hundred and thirty-one fatal and non-fatal accidents have been reported during the year. Personal inquiries and inspections have been made in each case of fatal accident and also those involving serious personal injury, and where the circumstances appeared to call for it, the coroner's inquest has been attended either by the assistant inspector or myself, with the object of eliciting from the witnesses a true and fair account of the circumstances under which they arose. These inquiries have been fully and carefully made, and in those instances where the evidence seemed to call for it, the juries have made recommendations as to precautions to be taken in the future, and where it has appeared from the evidence that there had been a breach of some specific requirement of the Act of Parliament, proceedings have been taken, with your sanction, against the persons responsible.

A lively feeling has been sustained throughout the district that if any accident occurs through breach of rule it is certain to be detected and punished. This work necessarily occupies a great portion of an inspector's time, but it is certainly the most fruitful in good results. I feel that to omit strict inquiry into each accident with the object of devoting additional time to general inspections, where the inspector is not set in motion either by accident or complaint, would be mischievous.

Consistently with this work, and attention to innumerable other calls entailed in the working of an intricate Act of Parliament, every possible opportunity has been taken in obedience to your instructions to make general inspections of those mines which appeared most to need it.

In this work I have endeavoured to avoid taking any of the responsibility of management which properly falls upon the certificated manager and owner who alone are in a position to exercise the constant and careful supervision required to control the operations in a mine; feeling that for an inspector to appear to take any such responsibility upon himself would be impairing the best security for the observance of the law without providing another in its stead, and the inspector himself would no longer be in the position of an independent and impartial witness.

During the year, two hundred and twenty underground inspections have been made, ninety-seven inquests have been attended, twenty-one days have been spent in police courts, giving evidence in cases of proceedings taken against managers and owners of mines, 14 in London; two hundred and eighty-one visits of inspection have been made to examine report books, plans, machinery, and the general arrangements of the collieries in the district, and to make necessary inquiries in reference to the innumerable requirements of the Act of Parliament, but more especially to gain a familiar knowledge of the peculiarities of the various mines, their liability to danger from sudden irruptions of dangerous gases or water, and to keep conversant with their stages of development, with the constant aim by encouragement and advise to obtain a better and safer system of management.

Several letters of complaint (in all 19) have been received from workmen and attended to without delay, and I have found that as a rule these complaints have been reasonable and called for; several have had reference to surface-hands being employed beyond hours, and have arisen from some misconception on the part of the workpeople as to the hours they can be legally employed. There have also been complaints of boys being kept underground beyond the legal hours, I believe with some truth, but I have not yet met with a case where proceedings could have been taken with reasonable certainty of a conviction.

Thirty-eight formal notices in writing have been sent to owners and managers of mines requiring practices which were an evident breach of the Act of Parliament to be discontinued. These notices have had reference to various matters, such as use of gunpowder, safety-lamps, ventilation, manner of keeping report books, fencing, disused shafts, working hours, pit sides, firedamp, &c., &c.

Proceedings against managers and owners have been, with your sanction, instituted in the following cases:

Wern Colliery, Bagillt:
Manager fined five pounds for breach of the 1st General Rule.
Fireman fined ten shillings for breach of the 14th Special Rule.

Halsnead Colliery, Prescot:
Owner fined five pounds for breach of the 1st General Rule.
Manager fined two pounds for breach of the 8th General Rule.
" " " 9th Special Rule.
" " " 1st General Rule.

Ffrith Colliery, Wrexham:
Trustee in liquidation of owner charged with a breach of the 41st section. Failed to show liability, and case dismissed.

Edge Green Colliery, St. Helen's:
Agent fined twenty pounds for breach of the 1st General Rule.
Manager " " "
Fireman fined two pounds for breach of the 2nd General Rule.

Bryn Mally Colliery, Wrexham:
Manager charged with a breach of the 1st General Rule. Particulars in Report.

Two managers of mines were charged under the 32nd section, viz.: the manager of the Wood Pit, Haydock Colliery, see Report; and also the manager of Halsnead Colliery, the latter forfeiting his certificate rather than submit to the inquiry.

The specific requirements of the law are generally satisfactorily carried out. The fencing of abandoned shafts in the Welsh part of the district is not as satisfactorily done as it ought to be, old wire ropes fastened to wooden posts and constantly needing repair being substituted for a substantial wall.

Charter-masters are still appointed as the competent persons to fire shots at a few of the smaller mines, but this bad practice is gradually being discontinued.

In some instances extensive and dangerous mines are placed under the entire control of men of very limited and local experience, perhaps with the object of securing a cheap management. I believe that this practice has been fruitful of disaster in the past and will be in the future. The management of all mines of this dangerous class should be controlled by some person of the widest possible experience.

The annual returns have not been forwarded with the usual promptness this year. The following collieries failing in this respect: Golborne, Sandycroft, Oakpits, Nerquis, Bistre, Hazelwood, Delf, Plas Power, Trefynant, Alliance, Rainford Delf, Berry Street, Kirklees (Parry's), Victoria.

When forwarding plans of abandoned mines, managers frequently omit a section of one of the shafts. This is required under the interpretation clause, see word "plan." "The term "'plan' includes a map and section, and a correct copy or tracing of any original plan as "so defined."

The restrictions as to the employment of boys under age are strictly carried out, but I find there are a great many youths in the mines who cannot either read or write; this seems to be more especially the case in the neighbourhood of St. Helens; perhaps this is the result of a past school system and may not be possible under the existing system; however, reference to it here can do no harm.

The workmen of this district do not avail themselves of the power which No. 30 General Rule of the Act of Parliament has conferred upon them; viz., to inspect the mines periodically for themselves. They seldom doubt the managers' willingness to protect them; and so long as this duty is optional it is not likely to be generally carried out, because it implies want of confidence. This feeling would disappear if the duty was made compulsory, but it is questionable whether its practice would be beneficial, because it would be, to some extent,

substituting unskilled and irresponsible supervision for the skilled and responsible supervision of the officials.

The present requirement of the law, that every person before he can act as manager of a mine must have passed the necessary examination and have obtained a certificate of competency, is likely to prove most useful, but the subjects of examination should be wider than at present and should include tests of the general education of the candidates.

Metalliferous Mines.—There have been only two freestone quarries working underground in the coalmeasures and classed under this Act. One fatal accident has occurred through an accidental fall of stone.

In the Lancashire part of the district the workmen killed and injured have with few exceptions been members of the "Lancashire and Cheshire Miners Permanent Relief Society," and their relatives have received from this society substantial compensation, the payments being as follows:—The widow of any member killed, receives 5*s.* per week during widowhood, and each child under 12 years of age 2*s.* 6*d.* per week, and in case of non-fatal injury the member receives 8*s.* per week during disablement; there are also payments for expenses, &c. Thus the distress and want so frequently entailed through the loss of husband or son has been partially alleviated.

With the aid of the leading colliery owners, a society in every respect similar to the above has now been formed in North Wales, and already numbers nearly 6,000 members, or two thirds of the coal workers in that district. I have given every possible assistance in the formation of this society. It is very questionable whether any system of compensation for injuries received by workmen employed in mines can be introduced which will prove of greater real benefit to the workmen themselves, than results from the working of such funds as these.

The employers' subscriptions to these funds in some instances amount to twenty per cent. of the whole, thus they compensate one-fifth of the accidents which occur, and this without recourse to litigation, often so fruitful in costs and dissensions and barren of profit.

Mr. Hedley has acted as assisting inspector, and has ably and diligently performed his duties.

I have, &c.,
HENRY HALL.

The Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Whitehall, London.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the WEST LANCASHIRE DISTRICT, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Jan. 5	1	New Boston -	Haydock - -	Richard Evans & Co. -	Daniel Cain - -	Dataler -	35	Whilst preparing a place for arching, a portion of the roof fell upon him.	–	1	–	–	–	1
„ 10	2	Park Lane -	Wigan - -	Garswood Coal & Iron Co., Limited.	Joseph Landry -	Labourer -	32	Crushed between waggons. Neglected to sprag the waggons at the back before lowering the others under the screens, and they followed him down.	–	–	–	–	1	1
„ 21	3	Abram - -	Ditto - -	Abram Coal Co. - -	Thomas Aspinall -	Dataler -	48	Fall of roof when building a pack -	–	1	–	–	–	1
„ 23	4	Whiston -	Prescot - -	Wigan & Whiston Coal Co., Limited.	Thomas Cairns -	Ditto -	42	Fall of roof. Omitted to set a prop before commencing to remove a pack.	–	1	–	–	–	1
„ 27	5	Tawd Vale -	Skelmersdale -	Tawd Vale Colliery Co., Limited.	Luke Martindale -	Sinker -	25	The deceased got into the hoppet from the mouthing whilst the engineman was away from his engine, and their weight caused the engine to start, lowering them into sump full of water. They should have waited for the signal from engineman.	–	–	2	–	–	2
					William Cox -	Ditto -	27							
„ 28	6	Newtown -	Wigan - -	Lamb & Moore - -	John Parkinson -	Pony-driver	13	Deceased was found dead under a set of loaded tubs.	–	–	–	1	–	1
„ 29	7	California -	Ditto - -	Wigan Coal & Iron Co., Limited.	George Potter -	Collier -	21	Fall of coal from face. Deceased had just commenced to "hole," when the piece burst off from a "slip."	–	1	–	–	–	1
„ 31	8	St. Helens -	St. Helens -	St. Helens Colliery Co., Limited.	Thomas Dwyer -	Labourer -	65	Whilst improperly passing over the drum of a small hauling engine when in motion his foot slipped, and was crushed between the drum and side wall.	–	–	–	–	1	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Feb. 6	9	New Boston	Haydock	Richard Evans & Co.	Henry Hesketh	Dataler	43	Fall of roof whilst drawing chocks. Deceased had just been cautioned by fireman.	–	1	–	–	–	1
„ 8	10	California	Wigan	Wigan Coal & Iron Co., Limited.	John Battersby	Rolly hooker	14	Fall of roof, owing to the breakage of two bars.	–	1	–	–	–	1
„ „	11	Douglas Bank	Ditto	Rose Bridge & Douglas Bank Colliery Co., Limited.	John Miney	Collier	24	Fall of top coal whilst he was wedging the bottom coals down. Deceased had omitted to "sprag."	–	1	–	–	–	1
„ 9	12	Crawford	Ditto	Wigan Coal & Iron Co., Limited.	Thomas Brannan	Labourer	43	Crushed between waggon buffers. He was pushing a waggon along with his back to the waggon, when several others were shunted against him. The engineman stated that he whistled, but deceased could not have heard it.	–	–	–	–	1	1
„ 11	13	Park Lane	Ditto	Garswood Coal & Iron Co., Limited.	William Hooper	Collier	21	A piece of stone fell from roof, knocking out several props, and causing more of the roof to fall on deceased.	–	1	–	–	–	1
„ 14	14	Moss	Ditto	Pearson & Knowles Coal & Iron Co., Limited.	Thomas Green	Drawer	18	Deceased sprained his arm when lifting a tub on to the rails. An abscess formed, from which he died.	–	–	–	1	–	1
„ 16	15	Meadow	Ditto	Lamb & Moore	John Underwood	Collier	57	Run over by a tub which he thought he had left securely fastened. Deceased was injured on September 5, 1877.	–	–	–	1	–	1
„ 17	16	Whiston	Ditto	Wigan & Whiston Coal Co., Limited.	Abel Wall	Fireman	44	Explosion of gas	7	–	–	–	–	7
					James Briscoe	Dataler	40							
					Isaac Anders	Ditto	40							
					John Macdonald	Ditto	20							
					James Williams	Ditto	25							
					Henry Heyes	Ditto	33							
					James Mullaney	Ditto	30							

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Feb. 2	17	Bickershaw -	Wigan - -	Ackers, Whitley, & Co., Limited.	John Murry -	Drawer -	20	Deceased omitted to put in his scotches, and when he started "down brow" the tub overpowered and knocked him down.	–	–	–	1	–	1
Mar. 5	18	Douglas Bank -	Ditto -	Rose Bridge & Douglas Bank Colliery Co., Limited.	William Ratcliffe -	Dataler -	35	Killed by fall of roof when engaged in getting it down.	–	1	–	–	–	1
„ 7	19	Swan Lane -	Ditto - -	Edward Johnson - -	Thomas Topping -	Ditto -	45	The deceased were engaged in repairing and timbering a road, and the timber which they had set on the previous day gave way and fell upon them.	–	2	–	–	–	2
					Joseph Molyneux -	Ditto -	40							
„ „	20	Lindsay - -	Ditto -	Wigan Coal & Iron Co., Limited.	Joseph Harmer -	Ditto -	60	Deceased, with 50 other men, was riding up an incline to his work, when the rope broke, and the tubs running back, he was crushed between two of them. The cause of the breakage was not discovered, the rope being in good order.	–	–	–	1	–	1
„ 9	21	Victoria - -	Rainford -	Victoria Colliery Co., Limited.	Thomas Dagnall -	Collier -	36	Fall of roof. The place was badly timbered, which should have been seen by the fireman when he visited it shortly before the accident.	–	1	–	–	–	1
„ 15	22	Bamfurlong -	Wigan - -	Cross, Tetley, & Co., Limited.	William Armested	Labourer -	17	When lowering waggons from under the screens his foot caught between the points, and the waggons went over his legs.	–	–	–	–	1	1
„ 22	23	Ince Hall -	Ditto - -	Ince Hall Coal & Cannel Co., Limited.	Robert Elsden -	Pitman -	25	Deceased slipped from a "bearer" whilst he was engaged in repairing the pump rods, and fell to bottom of pit.	–	–	1	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878. Mar. 28	24	Hindley Hall	Wigan	Pearson & Knowles Coal and Iron Co., Limited.	John Brown	Pony-driver	12	A small stone fell from roof of horse road on to him.	–	1	–	–	–	1
April 9	25	Platt Lane	Ditto	Wigan & Whiston Coal Co., Limited.	Henry Heyes	—	—	Deceased was a tramp, and it is supposed that he was looking for a place to sleep in, when by some means he got over the fence, and fell to the bottom of the pit.	–	–	1	–	–	1
„ 12	26	Haydock	Haydock	Richard Evans & Co.	Philip Tracey	Labourer	40	Killed whilst endeavouring to pass under buffers of waggons when in motion.	–	–	–	–	1	1
„ „	27	Barley Brook	Wigan	Pearson & Knowles Coal and Iron Co., Limited.	Thomas Halliwell	Jigger	16	The rope broke when he was lowering a train of loaded tubs down the incline, and he was struck on the head either by the end of the rope or by the break handle. The rope appeared to be of good material, and had not been long in use.	–	–	–	1	–	1
„ 13	28	Pemberton	Ditto	Jonathan Blundell & Sons	John Kelly	Prop-taker	40	Killed by fall of roof whilst drawing props.	–	1	–	–	–	1
„ 18	29	Holland	Upholland	Wigan Coal & Iron Co., Limited.	Louis Glover	Collier	49	Killed by fall of coal owing to his neglect to sprag.	–	1	–	–	–	1
„ 30	30	Abram	Wigan	Abram Coal Co.	Aquila Wilcock	Drawer	23	Crushed between waggon buffers. Was standing between the waggons unknown to the brakesman whilst shunting was going on.	–	–	–	–	1	1
May 2	31	Nutgrove	St. Helens	James Radley	John Birkell	Collier	25	Killed by fall of roof. A simple accident, the place being well timbered.	–	1	–	–	–	1
„ 3	32	Hindley Hall	Wigan	Roger, Leigh, & Co.	Thomas McLoughlen	Dataler	50	Deceased was walking up the incline from his work, and, in passing umder the endless chain pulley at the top, caught his head between the rope and the wheel, which was fenced all round, but not underneath. This the manager promised should be done.	–	–	–	1	–	1

List of Fatal Accidents—*continued*.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
May 20	33	Saw Mill -	Wigan - -	Ince Hall Coal and Cannel Co., Limited.	Ellis Green - -	Dataler -	50	Fall of roof whilst building a "pack." Deceased neglected to prop the roof before commencing work.	–	1	–	–	–	1
June 3	34	White Moss -	Skelmersdale -	White Moss Coal Co., Limited.	Stephen Buckley -	Collier -	26	When getting his coal down, and whilst pulling off a piece with his pick, a large quantity came away unexpectedly from a "slip," and caught him before he had time to get away.	–	1	–	–	–	1
„ 5	35	Plank Lane -	Wigan - -	Ackers, Whitley, & Co., Limited.	James Hardman -	Carpenter -	33	A piece of wood fell on to his foot, causing injuries which resulted fatally.	–	–	–	–	1	1
„ 7	36	Wood Pit -	Haydock -	Richard Evans & Co. -	Roger Bankes -	Underlooker	41	Explosion of gas - - -	189	–	–	–	–	189
					George Millington	Fireman -	37							
					James Lyon -	Dataler -	44							
					Thomas Wood -	Bricklayer -	25							
					James Winstanley	Dataler -	57							
					Michael King -	Ditto -	37							
					Michael Roach -	Ditto -	25							
					William Wilcock -	Ditto -	61							
					William Fairhurst	Ditto -	27							
					Edward Rogers -	Ditto -	37							
					James McGovern -	Ditto -	42							
					Robert Royers -	Ditto -	45							
					Edward Sutton -	Ditto -	40							
					Thomas Reed -	Ditto -	36							
					Brien Lynch -	Ditto -	22							
					William Smith, Senr.	Ditto -	33							
					William Dearden -	Ditto -	32							
					Joseph Twiss -	Ditto -	22							
					Peter Tyrer -	Ditto -	51							
					John Conway -	Ditto -	20							
					George Hales -	Ditto -	32							
					James Barnes -	Ditto -	30							

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878. June 7 —*cont.*	36	Wood Pit -	Haydock -	Richard Evans & Co. -	James Higson -	Dataler -	19	Explosion of gas						
					Joseph Cotteral -	Ditto -	27							
					George Powell -	Ditto -	35							
					John Jones - -	Ditto -	27							
					George Morton -	Ditto -	58							
					George Danks -	Ditto -	24							
					Ben Pilling - -	Ditto -	27							
					James Bibbery -	Ditto -	50							
					Thomas Shaw -	Ditto -	22							
					William Smith, junr.	Ditto -	19							
					William Welding -	Ditto -	21							
					John Welding -	Ditto -	21							
					James Whittle -	Ditto -	62							
					William Barnes -	Ditto -	51							
					Henry Banner -	Ditto -	47							
					Frank Molyneux -	Ditto -	51							
					Woodwin, Jones -	Ditto -	21							
					Charles Redman -	Ditto -	26							
					Peter Roach -	Ditto -	22							
					Thomas Melling -	Ditto -	22							
					Robert Ellis -	Ditto -	33							
					Thomas Harrison -	Ditto -	53							
					William Walpole -	Ditto -	48							
					Martin Roach -	Ditto -	22							
					George Swift -	Collier -	31							
					Edward Pimblett -	Ditto -	43							
					Richard Chorley -	Ditto -	36							
					James Robinson -	Ditto -	36							
					Thomas Downs -	Ditto -	43							
					John Green, junr.	Ditto -	23							
					Charles Green -	Ditto -	21							
					Richard Evans -	Ditto -	20							
					Thomas Thompson	Ditto -	28							
					Thomas McCarty -	Ditto -	22							

List of Fata. Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878. June 7 —*cont.*	36	Wood Pit - -	Haydock - -	Richard Evans & Co. -	James Twiss -	Collier -	27							
					Samuel Winstanley	Ditto -	51							
					John Boon, Senr. -	Ditto -	42							
					Edward Richardson	Ditto -	39							
					Thomas Clare -	Ditto -	37							
					Robert Key - -	Ditto -	30							
					Peter Hughes -	Ditto -	37							
					William Baines -	Ditto -	35							
					James Fairhurst -	Ditto -	41							
					Richard Green -	Ditto -	48							
					Enoch Booth -	Ditto -	25							
					Joseph Norbury -	Ditto -	44							
					Thomas Whittle -	Ditto -	20							
					John Pilling -	Ditto -	23							
					Nathan Boon -	Ditto -	45							
					John Boon, junr. -	Ditto -	19							
					Barnard Nolan -	Ditto -	27	Ditto.						
					John Turton -	Ditto -	30							
					James Layland -	Ditto -	40							
					Thomas Cawley -	Ditto -	30							
					Joseph Whittle -	Ditto -	26							
					James Gerrard -	Ditto -	28							
					John Roberts -	Ditto -	26							
					William Leyland -	Ditto -	46							
					George Evans -	Ditto -	29							
					Jonathan Rowley -	Ditto -	38							
					James Wild - -	Ditto -	23							
					Edward Waterworth	Ditto -	38							
					William Turnock -	Ditto -	30							
					Peter Sharples -	Ditto -	35							
					Evan Meredith -	Ditto -	39							
					Isaac Boon - -	Ditto -	21							
					Thomas Pimblett -	Ditto -	36							

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878. June 7 —*cont.*	36	Wood Pit -	Haydock - -	Richard Evans & Co. -	Michael Kelley -	Collier -	27	Explosion of gas.						
					Jonathan Johnson	Ditto -	41							
					John Heyes - -	Ditto -	38							
					Llewellyn Lloyd -	Ditto -	29							
					John Williams -	Ditto -	28							
					Daniel Gittens -	Ditto -	35							
					Peter Millington -	Ditto -	32							
					John Evans -	Ditto -	37							
					James Greenall -	Ditto -	34							
					Thomas Sharples, senr.	Ditto -	73							
					Thomas Sharples, junr.	Ditto -	41							
					James Ashcroft -	Ditto -	53							
					John King - -	Ditto -	37							
					John Welding -	Ditto -	36							
					William Smith -	Ditto -	30							
					William Roberts -	Ditto -	35							
					John Edwards -	Ditto -	49							
					Edward Evans -	Ditto -	40							
					Thomas Pilkington	Ditto -	26							
					William Connah -	Ditto -	47							
					Thomas Skidmore	Ditto -	24							
					John Swift - -	Drawer -	29							
					John Pimblett -	Ditto -	21							
					Daniel Wilson -	Ditto -	19							
					George Whittley -	Ditto -	20							
					Ellis Roberts -	Ditto -	26							
					John Murphy -	Ditto -	17							
					James Fox -	Ditto -	27							
					Robert Hughes -	Ditto -	26							
					William Carey -	Ditto -	16							
					James Winstanley	Ditto -	18							

List of Fatal Accidents—*continued*.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
June 7 —*cont.*	36	Wood Pit -	Haydock -	Richard Evans & Co. -	Thomas Arnold -	Drawer -	25							
					Edward Twiss -	Ditto -	18							
					Edward Byrom -	Ditto -	16							
					John Baines -	Ditto -	20							
					James Hindley -	Ditto -	19							
					William Hughes -	Ditto -	20							
					Joseph Green -	Ditto -	23							
					Thomas Burrows -	Ditto -	19							
					John Knowles -	Ditto -	23							
					Peter Nolan -	Ditto -	19							
					Thomas Stillwell -	Ditto -	19							
					William Owen -	Ditto -	12							
					James Owen -	Ditto -	14							
					Robert Rowland -	Ditto -	20							
					William Boon -	Ditto -	15							
					Joseph Boon -	Ditto -	14							
					John Pimblett -	Ditto -	13	Ditto.						
					Joseph Johnson -	Ditto -	15							
					John Jones -	Ditto -	22							
					Charles Hughes -	Ditto -	29							
					Matthew Fairhurst	Ditto -	24							
					Thomas Edwards -	Ditto -	18							
					Thomas Rowley -	Ditto -	15							
					James Pierpoint -	Ditto -	17							
					Henry Waterworth	Ditto -	18							
					Michael Whalin -	Ditto -	21							
					James Lloyd -	Ditto -	27							
					John Jordan -	Ditto -	25							
					James Thomas -	Ditto -	32							
					Arthur Gore -	Ditto -	25							
					John Jones -	Ditto -	19							
					James Ashcroft -	Ditto -	16							
					Ralph Ashcroft -	Ditto -	21							

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.						
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.	
1878. June 7 —*cont.*	36	Wood Pit -	Haydock - -	Richard Evans & Co. -	John Cusic -	Drawer -	18	Explosion of gas.							
					Hugh Wade -	Ditto -	21								
					Thomas Boon -	Ditto -	18								
					George Cunliffe -	Ditto -	24								
					Edward Evans -	Ditto -	16								
					Robert Evans -	Ditto -	19								
					John Hughes -	Ditto -	40								
					James Dillon -	Ditto -	16								
					William Connah -	Ditto -	20								
					John Jones -	Ditto -	23								
					Edward Manley -	Ditto -	21								
					James Clifford -	Ditto	21								
					John Blimstone -	Ditto -	20								
					John Evans -	Ditto -	23								
					Joseph Dearden -	Jiggerman -	28								
					William Unsworth	Ditto -	23								
					Thomas Dixon -	Ditto -	48								
					Henry Waterworth	Ditto -	23								
					James Shaw -	Ditto -	17								
					William McGlynn	Ditto -	19								
					Job Swain - -	Ditto -	18								
					John Molyneux -	Ditto -	20								
					Joseph Hindley -	Ditto -	15								
					James Roberts -	Pony-driver	15								
					James Peake -	Ditto -	14								
					Thomas Winstanley	Ditto -	13								
					George Green -	Ditto -	15								
					John Redford -	Ditto -	15								
					John Evans -	Ditto -	16								
					Joseph Griffiths -	Ditto -	14								
					John Hindley -	Ditto -	12								
					William Jameson -	Ditto -	14								
					William Hindley -	Ditto -	13								

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
June 7 —*cont.*	36	Wood Pit -	Haydock - -	Richard Evans & Co. -	Thomas Waterworth	Pony-driver	12	} Explosion of gas.						
					Henry Rowley -	Coupler -	13							
					William Winstanley	Ditto -	12							
June 7	37	St. Helens -	St. Helens -	St. Helens Colliery Co., Limited.	Stephen Ball -	Collier -	35	Fall of roof. A simple accident -	–	1	–	–	–	1
„ 8	38	Wood Pit -	Haydock - -	Richard Evans & Co. -	James Callaghan -	Dataler -	32	Killed by fall of roof whilst clearing away a heavy fall after the explosion.	–	1	–	–	–	1
„ „	39	Holland - -	Upholland -	Wigan Coal & Iron Co., Limited.	William Birch -	Rolly-hooker	13	Crushed by timber tram, which by some unexplained means became detached from rope on incline.	–	–	–	1	–	1
„ 13	40	Wood Pit -	Haydock - -	Richard Evans & Co. -	George Britch -	Loco. fireman	20	In jumping from engine, slipped and fell under wheels.	–	–	–	–	1	1
„ 19	41	Halsnead -	Prescot - -	Thomas Lea & Sons -	Samuel Atherton -	Collier -	24	Neglected to sprag his top coals, which fell upon him when cutting them.	–	1	–	–	–	1
„ 24	42	Kirkless - -	Wigan - -	Wigan Coal & Iron Co., Limited.	William Hilton -	Waggon greaser.	55	The deceased was sitting on the stretcher of a waggon, and fell under the wheels, owing to another waggon coming in contact with it.	–	–	–	–	1	1
July 1	43	Garswood Park	St. Helens -	David Bromilow & Co. -	Christopher Cassidy	Dataler -	28	Cassidy and another man were clearing away a fall which had just occurred in the level whilst Austin held a light for them. A large stone which they were turning over slipped out of their hands, and fell against a prop, knocking it out, which caused more of the roof to fall upon the deceased.	–	2	–	–	–	2
					Charles Austin -	Pony-driver	15							
„ 12	44	Havannah -	Ditto -	Richard Evans & Co. -	Robert Lancaster -	Collier -	43	Crushed against his coal face by his own tub when going down hill into his working place.	–	–	–	1	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1878.														
July 24	45	Orrell - -	Wigan - -	Orrell Coal & Cannel Co., Limited.	John Moffatt -	Brakesman	35	Crushed between waggon buffers -	–	–	–	–	1	1
„ 27	46	Pemberton -	Ditto - -	Jonathan Blundell & Sons	John Williams -	Pony-driver	15	Fell from Wigan 9-ft. mouthing to bottom of pit. Deceased went past the onsetter when his attention was away from the pit.	–	–	1	–	–	1
„ 31	47	Ditto -	Ditto - -	Ditto - -	Stephen Davies -	Collier -	45	Deceased was run over by the loaded tub of another man who was following him out along the level.	–	–	–	1	–	1
Aug. 7	48	Hindley Field -	Ditto -	Norris & Lees - -	John Darlington -	Fireman -	29	Killed by fall of roof when preparing to set a prop.	–	1	–	–	–	1
„ 10	49	Bradley Hall -	Ditto -	B. & R. Fisher - -	William Needham	Dataler -	60	Fall of roof. A simple accident -	–	1	–	–	–	1
„ 13	50	White Moss -	Skelmersdale -	White Moss Coal Co., Limited.	Henry Hodgkinson	Metalman -	31	Killed by charge exploding whilst ramming shot with copper rammer.	–	–	–	1	–	1
„ 15	51	Broomfield -	Wigan - -	Wigan Coal & Iron Co., Limited.	William Winstanley	Collier -	22	Fall of roof. A simple accident -	–	1	–	–	–	1
„ 18	52	Plank Lane -	Ditto -	Ackers, Whitley, & Co., Limited.	William Scott -	Ditto -	19	Deceased was looking at the fan, and by some means caught his hand in the vanes.	–	–	–	–	1	1
„ 19	53	Bickerstaffe -	Skelmersdale -	Bromilow, Forster, & Co., Limited.	John Eccleston -	Mechanic -	55	Crushed by boiler rolling on to him whilst assisting in its removal.	–	–	–	–	1	1
„ 27	54	Downal Green -	Ashton - -	Thomas Stone & Son -	James Hazleden -	Drawer -	16	Fall of roof from "slips." A simple accident.	–	1	–	–	–	1
„ 29	55	Sutton Heath -	St. Helens -	James Radley - -	Henry Bridge -	Collier -	21	Fall of top coal. Neglected to set sprags.	–	1	–	–	–	1
Sept. 9	56	Lindsay - -	Wigan - -	Wigan Coal & Iron Co., Limited.	David Leyland -	Ditto -	47	Fall of roof when preparing to set props.	–	1	–	–	–	1
„ 13	57	Park Lane -	Ditto - -	Garswood Coal & Iron Co., Limited.	James Taberner -	Ditto -	18	Fall of coal. Neglected to set sprags.	–	1	–	–	–	1

List of Fatal Accidents—*continued*.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878. Sept. 13	58	Low Hall	Wigan	Moss Hall Coal Co., Limited.	William Bond	Dataler	24	Deceased had lighted two shots, and retired to a place of safety. He returned to the place, thinking that both shots had exploded, but just as he arrived the second shot went off.	–	–	–	1	–	1
„ 16	59	Bamfurlong	Ditto	Cross, Tetley, & Co., Limited.	William Rickett	Collier	25	Deceased was riding out from his work on a loaded tub (contrary to the rules), and was crushed against the roof.	–	–	–	1	–	1
„ 23	60	Long Lane	Ditto	Edward Johnson	Henry Hawkinson	Bricklayer	41	Fell from 4-ft. mine to pit-bottom. Deceased was bricking the pit, when the scaffold on which he stood slipped, and threw him off.	–	–	1	–	–	1
„ 26	61	California	Ditto	Wigan Coal & Iron Co., Limited.	Robert Calland	Pony-driver	14	Knocked down by pony, and fell under loaded tubs.	–	–	–	1	–	1
Oct. 4	62	Edge Green	Golborne	Richard Evans & Co.	William Haslam	Ditto	14	Fell under tubs, owing to horse getting restive.	–	–	–	1	–	1
„ 14	63	White Moss	Skelmersdale	White Moss Coal Co., Limited.	Richard Clarke	Drawer	27	A piece of coal burst off from side. Not commenced to hole.	–	1	–	–	–	1
„ 18	64	Bamfurlong	Wigan	Cross, Tetley, & Co., Limited.	Matthew Higham	Pony-driver	16	Kicked by a pony which he was striking.	–	–	–	1	–	1
„ 19	65	Ince Hall	Ditto	Ince Hall Coal & Cannel Co., Limited.	James Brownlow	Brakesman	30	Killed by the bursting of locomotive boiler.	–	–	–	–	1	1
„ 24	66	Victoria	Rainford	Victoria Colliery Co., Limited.	Peter Thomas	Collier	32	Fall of roof. A simple accident	–	1	–	–	–	1
„ 28	67	Park Lane	Wigan	Garswood Coal & Iron Co., Limited.	Joseph Leyland	Ditto	33	After attempting to get his top coals down, recommenced to hole without setting sprags.	–	1	–	–	–	1
„ 31	68	Mesnes	Ditto	W. & J. Turner	John Lowe	Ditto	41	Deceased was drawing a prop to let the roof fall, and it came too suddenly, before he could get away.	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Nov. 7	69	Ince Hall -	Wigan - -	Ince Hall Coal & Cannel Co., Limited.	Isaac Hadyhead -	Dataler -	45	Fall of roof. A simple accident -	–	1	–	–	–	1
„ „	70	Taylor -	Ditto - -	Wigan Coal & Iron Co., Limited.	John Swift - -	Ditto -	49	Fall of roof whilst building a pack. Deceased should have set a prop.	–	1	–	–	–	1
„ 15	71	Hindley Green	Ditto - -	J. Scowcroft & Co., Limited.	John Edward Crook	Collier -	19	Fall of roof from slips. A simple accident, the place being well timbered.	–	1	–	–	–	1
„ 20	72	Queen - -	Haydock -	Richard Evans & Co. -	John Tunnicliffe -	Ditto -	32	Fall of roof. A simple accident -	–	1	–	–	–	1
Dec. 17	73	Bickershaw -	Wigan - -	Ackers, Whitley, & Co., Limited.	Thomas Reynolds -	Dataler -	—	Died in Wigan Infirmary from injuries which he stated he had received in the pit two months previously, but of which he had not spoken to any of the officials.	–	–	–	1	–	1
„ 18	74	Sherdley - -	St. Helen's -	Bourne & Robinson -	Michael Boyle -	Collier -	35	Fall of roof. Deceased was told by fireman not to go under that part of the roof, but after he had left the working place, the deceased went under it to load up some coal.	–	1	–	–	–	1
„ 26	75	Bamfurlong -	Wigan - -	Cross, Tetley, & Co., Limited.	Thomas Evans -	Ditto -	35	Deceased was getting his coals down, after firing a shot, when a piece of stone unexpectedly fell with the coal.	–	1	–	–	–	1
„ 31	76	Queen Pit -	Haydock - -	Richard Evans & Co. -	Thomas Tanny -	Drawer -	26	Fall of roof. A simple accident -	–	1	–	–	–	1

List of the FATAL METALLIFEROUS ACCIDENTS, and LOSS OF LIFE arising therefrom, in the WEST LANCASHIRE DISTRICT, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Mine.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878. Mar. 22	1	Bispham Quarry	Billinge - -	James Melling - -	William Rigby -	Quarryman	—	Fall of stone - - -	–	1	–	–	–	1

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the NORTH WALES DISTRICT, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878. Jan. 3	1	Englefield -	Holywell - -	Englefield Colliery Co. -	Robert Leighton -	Rolly-hooker	16	Deceased pulled a prop out, causing the roof to fall upon him.	–	1	–	–	–	1
„ „	2	Bettisfield -	Bagillt - -	Bettisfield Colliery Co., Limited.	Robert Evans -	Collier -	—	Fall of roof whilst drawing timber -	–	1	–	–	–	1
„ 5	3	Mostyn - -	Mostyn - -	Mostyn Coal & Iron Co., Limited.	Henry Hughes -	Ditto -	65	A small piece of coal fell from face. A simple accident.	–	1	–	–	–	1
„ 7	4	Brynkinalt -	Chirk - -	Brynkinalt Colliery Co., Limited.	Thomas Edwards -	Doggie -	32	Deceased was sitting at bottom of incline, when he was caught by descending tub, and crushed against side.	–	–	–	1	–	1
11	5	Pendwll - -	Wrexham -	Thomas Clayton - -	Thomas Beirne -	Banksman -	42	Deceased had temporarily removed the fence in order to take a tank out of the cage, and, whilst so engaged, slipped and fell down pit.	–	–	1	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Feb. 9	6	Bettisfield -	Bagillt - -	Bettisfield Colliery Co., Limited.	Thomas Roberts -	Timberman	55	Deceased was returning along tunnel from his work, and, on steping aside to allow a train of tubs to pass, was knocked down by a horse going in the contrary direction.	–	–	–	1	–	1
„ 16	7	Westminster -	Wrexham -	Westminster Brymbo Coal & Coke Co., Limited.	Edward Jones -	Collier -	26	Fall of roof. A simple accident, the place being well timbered to within two feet of the coal face.	–	1	–	–	–	1
„ 18	8	Willow - -	Buckley - -	George Watkinson & Sons, Limited.	Richard Jones -	Pony-driver	17	Deceased was riding in an empty tub, which got off the rails and knocked a prop out, which fell upon him.	–	1	–	–	–	1
„ 22	9	Brymbo -	Wrexham -	Brymbo - - -	Richard Francis -	Collier -	36	Explosion of gas - - -	1	–	–	–	–	1
„ 27	10	Elm - -	Buckley - -	George Watkinson & Sons, Limited.	Peter Kendrick -	Sinker -	24	Fell from hoppet when descending pit. Entirely due to deceased's own carelessness.	–	–	1	–	–	1
Mar. 23	11	Hope - -	Wrexham -	Lilleshall Coal & Iron Co., Limited.	John Davies -	Ditto -	55	Fell through a small hole in scaffold of sinking pit, and was drowned. Deceased had no business near the hole, and was not missed for some time.	–	–	1	–	–	1
Apr. 30	12	Ffrwd - -	Ditto - -	James Sparrow & Son -	Robert Parry -	Collier -	24	Fall of coal. A simple accident -	–	1	–	–	–	1
May 1	13	Coed Talon -	Mold - -	Coed Talon Colliery Co., Limited.	Joan Williams -	Ditto -	43	Deceased was re-setting a prop which had been blown out by a shot, when the roof fell upon him.	–	1	–	–	–	1
„ 7	14	Plas Power -	Wrexham -	Plas Power Coal Co. -	Samuel Jones -	Navvy -	42	Smothered by sudden fall of earth from side of new railway cutting.	–	–	–	–	1	1
„ 29	15	Pendwll -	Ditto - -	Thomas Clayton - -	Evan Williams - -	Collier -	24	Fall of coal from a slip. A simple accident.	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explusions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
May 30	16	Pendwll - -	Wrexham -	Thomas Clayton -	Joseph Millington	Collier -	34							
					David Edwards -	Ditto -	29							
					Richard Powell -	Ditto -	56	Explosion of gas - - -	6	–	–	–	–	6
					Ishmael Davies -	Ditto -	28							
					John Powell -	Ditto -	18							
					John Davies -	Ditto -	20							
June 5	17	Pen-y-bryn -	Ruabon -	Morris & Pugh - -	John Morris -	Ditto -	55	Deceased was one of the owners of this small pit. In descending the pit the rope broke, and deceased was precipitated to the bottom. Deceased had been warned as to the insecure state of the rope.	–	–	1	–	–	1
„ 17	18	Maes-y-greg -	Buckley - -	George Watkinson & Sons, Limited.	James Haywood -	Fireman -	58	The incline rope became detached from the tub, which caught deceased as he was going up incline. The brakesman had called out to deceased to get into a refuge place, and he replied "all right, go on."	–	–	–	1	–	1
July 2	19	Wynnstay -	Ruabon - -	New British Iron Co., Limited.	Evan Jones - -	Collier -	43	Fall of roof. A simple accident -	–	1	–	–	–	1
„ 17	20	Vron - -	Wrexham -	Vron Colliery Co., Limited.	Thomas Povah -	Labourer -	61	Deceased was stocking coal on the bank, and fell off the heap, the tub falling on him.	–	–	–	–	1	1
Aug. 9	21	Lexham Green	Buckley - -	- - - -	Richard Evans -	Collier -	49	Fall of coal from side. A simple accident.	–	1	–	–	–	1
„ 28	22	Mold Argoed -	Mold - -	Mold Argoed Colliery Co., Limited.	John Jones -	Drawer -	18	Killed by a small fall of coal which came from the pillar against which he was standing watching the collier.	–	1	–	–	–	1
Oct. 16	23	Wynnstay -	Ruabon -	New British Iron Co., Limited.	Henry Williams -	Collier -	65	Fall of coal over sprags.	–	1	–	–	–	1

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Colliery.	Where situate.	Owner's or Agent's Nmae.		Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Nov. 7	24	Bettisfield -	Bagillt - -	Bettisfield Colliery Co., Limited.	John Jones - -	Collier -	24	Deceased climbed over a fence, and walked into some firedamp, where he was found suffocated some time afterwards. He had left his lamp outside the fence. Deceased and his brother were driving a road to clear away this gas.	–	–	–	1	–	1
„ 25	25	Ditto - -	Ditto -	Ditto - -	Thomas Hughes -	Ditto -	35	Deceased was getting his coals down, when a stone fell from a slip on to him.	–	1	–	–	–	1
Dec. 17	26	Broughton -	Wrexham -	Broughton Coal Co. -	Miles Williams -	Ditto -	19	Explosion of gas - - -	1	–	–	–	–	1

List of Mines classed under the Coal Mines Regulation Act in Mr. Hall's District, 1878.

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1873, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
			West Lancashire.					
1	Abram Coal Co., Hindley Green, Wigan.	Abram	Hindley Green	Thomas Taylor	4	2	6	
2	Ackers, Whitley, & Co., Limited, Hindley Green, Wigan.	Bickershaw	Ditto	John Smith	5	2	7	
3	Ditto	Plank Lane	Ditto	Ditto	2	2	4	
4	Baldwin, Edward, Orrell, Wigan	Orrell Post	Orrell	Edward Baldwin	–	–	–	Manager not certificated; less than 30 persons employed.
5	Banks, Meyrick, Winstanley, Wigan	Winstanley	Wigan	George Holland	3	–	3	
6	Barrow Hæmatite and Steel Co.	Dalton	Ditto	–	–	–	–	Not working.
7	Bird, Thos., & Co., Rainford, St. Helens.	Moss House	Rainford	Thomas Bird	–	–	–	Manager not certificated; less than 30 persons employed.
8	Blundell, Jonathan, & Sons, Pemberton, Wigan.	Pemberton	Wigan	W. F. Greener	46	3	49	
9	Ditto	Venture	Ditto	Ditto	4	–	4	
10	Bold Colliery Co., Limited, Bold, St. Helens.	Bold	St. Helens	W. H. Harbottle	2	–	2	Sinking.
11	Bourne & Robinson, St. Helens	Peasley Cross	Ditto	Joseph Fairhurst	5	–	5	
12	Ditto	Sherdley	Ditto	Ditto	1	1	2	
13	Bramall, Hy., & Co., St. Helens	Ashtons Green	Ditto	Thomas Green	6	–	6	
14	Brindle, William Shevington, Wigan	Shevington Moor	Wigan	Wm. Brindle	–	–	–	Manager not certificated; less than 30 persons employed.
15	Bromilow, David, & Co., St. Helens	Garswood Park	St. Helens	Thomas Molyneux	2	2	4	
16	Ditto	Laffak Garswood	Ditto	Ditto	1	–	1	
17	Ditto	Stanley	Ditto	Ditto	–	–	–	
18	Bromilow, Forster, & Co., Limited, Skelmersdale.	Bickerstaffe	Skelmersdale	Jenkyn Humphreys	1	1	2	
19	Ditto	Moss	Ditto	Ditto	5	–	5	
20	Ditto	Lathom	Ditto	Ditto	–	–	–	
21	Ditto	Far Moss	Ditto	Ditto	–	–	–	
22	Carrs Colliery Co., Limited, Prescot	Carrs	Prescot	John Atherton	3	–	3	
23	Chapel House Colliery Co., Limited, Skelmersdale.	Chapel House, Nos. 1 and 2	Skelmersdale	Samuel Brierly	1	–	1	
24	Ditto	Ditto Nos. 3 and 4	Ditto	Ditto	–	–	–	

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1873, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
25	Collins Green Colliery Co., St. Helens	Collins Green	St. Helens	Joseph Moss	2	–	2	Sinking.
26	Crank Coal and Fireclay Co., Limited, Crank, St. Helens.	Crank	Ditto	John Seddon	1	–	1	
27	Crippin, Wm. & E. F., Brynn, Wigan.	Brynn Hall	Wigan	Thomas Flitcroft	12	–	12	
28	Ditto	Pemberton	Ditto	Ditto	–	–	–	
29	Crompton and Shawcross, Wigan	Ince Hall	Ditto	Wm. Hinchcliffe	–	–	–	
30	Ditto	Strangeways Hall	Ditto	Ditto	5	–	5	
31	Ditto	Amberswood	Ditto	Ditto	1	–	1	
32	Ditto	Fir Tree House	Ditto	Ditto	2	–	2	
33	Crooks, James, Arthur Street, St. Helens.	Eccleston	St. Helens	–	–	–	–	Not working.
34	Cross, Tetley, & Co., Limited, Ashton, Wigan.	Bamfurlong	Wigan	Walter Topping	8	4	12	
35	Ditto	Riding Lane	Ditto	Ditto	–	–	–	
36	Ditto	Mains	Ditto	Ditto	–	–	–	
37	Ditto	Fogg's Fold	Ditto	Ditto	1	–	1	Not working.
38	Cross, John, St. Helens	Royal	St. Helens	John Cross	1	–	1	
39	Crow Orchard Colliery Co., Limited, Skelmersdale.	Crow Orchard, Nos. 1 and 2	Skelmersdale	John Graham	4	–	4	
40	Ditto	Ditto, Nos. 3 and 4	Ditto	Ditto	–	–	–	
41	Darbyshire, J. W., Gidlow Lane, Wigan.	Barley Brook	Wigan	J. W. Darbyshire	1	–	1	
42	Dewhurst & Berry, Skelmersdale	Black Moss	Skelmersdale	Robert Kellett	–	–	–	
43	Eckersley, N., Wigan	Worsley Mesnes	Wigan	William R. Ellis	2	–	2	
44	Evans, Richard, & Co., Haydock, St. Helens.	New Boston, Nos. 1 and 2	Haydock	Samuel Cook	6	2	8	
45	Ditto	Queen	Ditto	Isaac Billinge	7	2	9	
46	Ditto	Lee	Ditto	Ditto	3	1	4	
47	Ditto	Old Boston	Ditto	John Turton	–	–	–	
48	Ditto	Wood	Ditto	Ditto	1	191	192	
49	Ditto	Lyme	Ditto	James Baines	2	–	2	Sinking.
50	Ditto	Havannah	Ditto	Henry Potter	7	1	8	

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
51	Evans, Richard, & Co., Haydock, St. Helens.	Pewfall, Nos. 1 and 2	Ashton	John Houghton	5	–	5	
52	Ditto	Ditto, Nos. 3 and 4	Ditto	William Smethurst				
53	Ditto	Downal Green	Ditto	Ditto	–	–	–	
54	Ditto	Lilly Lane	Ditto	James Potter	1	–	1	
55	Ditto	Edge Green, North	Golborne	John Parkinson	–	–	–	
56	Ditto	Ditto, Engine	Ditto	Ditto	8	1	9	
57	Fairhurst and Co., Orrell, Wigan	Bold	Orrell	–	1	–	1	Not working.
58	Fisher, B. and R., Standish, Wigan	Bradley Hall	Standish	Benjamin Fisher	4	1	5	
59	Garswood Coal and Iron Co., Limited, Ashton, Wigan.	Park Lane	Ashton	Thomas Corless	15	3	18	
60	Ditto	Upper Park Lane	Ditto	William Sharrock	–	1	1	
61	Gerrard, Lord, Ashton, Wigan	Garswood	Ditto	G. L. Robins	–	–	–	Manager not certificated; less than 30 persons employed.
62	Gidlow, Thos., Hindley, Wigan	Gidlow	Wigan	John Reynolds	–	–	–	
63	Glover, Benj. B., & Co., St. Helens	Phœnix	St. Helens	E. Schofield	1	–	1	
64	Greengate Colliery Co., Limited, St. Helens.	Greengate	Ditto	Joseph Barton	4	–	4	
65	Grant & Stevens, Billinge, Wigan	Billinge Hill	Wigan	–	–	–	–	Not working.
66	Hilton & Clarke, School Common, Wigan.	Alliance	Ditto	William Hilton	–	–	–	
67	Hitchin & Co., Orrell, Wigan	Springfield	Orrell	–	–	–	–	Not working.
68	Houghton, J., Skelmersdale	Berry Street	Skelmersdale	J. Houghton	–	–	–	Manager not certificated; less than 30 persons employed.
69	Howarth, Charles, Crank, St. Helens	Rainford Delf	Rainford	Charles Howarth	–	–	–	Do.
70	Ditto	Old Mill Lane	Ditto	Ditto	–	–	–	Clay only. Do.
71	Ince Hall Coal and Cannel Co., Limited, Wigan.	Arley	Wigan	W. H. Stephenson	1	–	1	
72	Ditto	East Cannel	Ditto	Ditto	–	1	1	
73	Ditto	Sawmill	Ditto	W. Bootle	15	1	16	
74	Ditto	Ince	Ditto	Ditto	3	2	5	
75	Ditto	Amberswood	Ditto	James Atherton	–	–	–	

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
76	Ince Hall Coal & Cannel Co., Limited, Wigan.	Birket Bank	Wigan	-	-	-	Pumping.
77	Ditto	Mesnes	Ditto	-	-	-	Do.
78	Ditto	Britannia	Ditto	-	-	-	Not working.
79	Johnson, Edward, Hindley Green, Wigan.	Swan Lane	Hindley Green	Moses Morris	7	2	9	
80	Ditto	Long Lane	Ditto	Ditto	-	1	1	
81	Ditto	Golborne	Golborne	Roger Yates	-	-	-	
82	Jolley, R. and W., Hindley Green, Wigan.	Albion	Hindley Green	-	-	-	Not working.
83	Laithwaite, John, Upholland, Wigan	Lawns Delf	Upholland	John Laithwaite	-	-	-	Manager not certificated; less than 30 persons employed.
84	Lamb and Moore, Wigan	Newtown	Wigan	G. E. Scarborough	3	1	4	
85	Ditto	Meadows, No. 1	Ditto	Ditto	9	1	10	
86	Ditto	Ditto, No. 2	Ditto	Ditto	-	-	-	
87	Leigh, Roger, & Co., Hindley, Wigan	Hindley Hall	Hindley	James Ashton	2	1	3	
88	Lee & Sons, Whiston, Prescot	Halsnead	Whiston	William Wanless	4	1	5	
89	Marsh, William, Dalton, Wigan	Bellvue	Dalton	William Marsh	-	-	-	Manager not certificated; less than 30 persons employed.
90	Meadowcroft and Barton, St. Helens	Croppers Hill	St. Helens	Wm. Barton	-	-	-	
91	Melling, Thos., Ashton, Wigan	Birchenheads	Ashton	Matthew Pilling	-	-	-	Do.
92	Middlehurst, John, Windle, St. Helens.	Windle	St. Helens	Robert McGill	-	-	-	
93	Mill Lane Mining Co., Limited, Rainford, St. Helens.	Mill Lane	Rainford	Paul Hunt	-	-	-	Clay only. Do.
94	Molyneux, George, & Co., Parr, St. Helens.	Redgate	St. Helens	George Molyneux	-	-	-	
95	Moss Hall Coal Co., Ince, Wigan	Moss Hall	Wigan	J. B. Latham	2	-	2	
96	Ditto	Low Hall	Ditto	Ditto	6	1	7	
97	Ditto	Brookside	Ditto	Ditto	-	-	-	
98	Moss Side Land & Brickworks Co., Limited, Skelmersdale.	Pear Tree House	Skelmersdale	H. Grundy	-	-	-	Manager not certificated; less than 30 persons employed.

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
99	Norris and Lees, Hindley Green, Wigan.	Hindley Field	Hindley Green	Robert Grundy	–	1	1	
100	Norley Coal and Cannel Co., Wigan	Norley	Wigan	Jonathan Longbottom	12	–	12	
101	Orrell Coal and Cannel Co., Limited, Orrell, Wigan.	Orrell	Ditto	John Ashurst	13	1	14	
102	Orrell Colliery and Firebrick Co., Limited, Orrell, Wigan.	Orrell Hall	Ditto	–	–	–	–	Not working.
103	Parry, Jas., Aspull, Wigan	Kirkless	Aspull	John Burgess	–	–	–	
104	Pearson and Knowles Coal and Iron Co., Limited, Wigan.	Barley Brook	Wigan	Bryan Tickle	–	1	1	
105	Ditto	Ince Hall	Ditto	Ditto	–	–	–	
106	Ditto	Hindley Hall	Ditto	Ditto	–	1	1	
107	Ditto	Ince Moss	Ditto	William Ackers	13	1	14	
108	Radley, James, St. Helens	Sutton Heath	St. Helens	William Hopton	3	1	4	
109	Ditto	Nutgrove	Ditto	Thomas Pinnington	2	1	3	
110	Ditto	Thatto Heath	Ditto	Ditto	–	–	–	
111	Ditto	Lea Green	Lea Green	William Hopton	–	–	–	Sinking.
112	Rainford Coal Co., Limited, Rainford St. Helens.	Rainford	Rainford	George Y. Greener	1	–	1	
113	Rose Bridge and Douglas Bank Colliery Co., Limited, Wigan.	Rose Bridge	Wigan	John Bryham	8	–	8	
114	Ditto	Douglas Bank	Ditto	William Bryham	5	2	7	
115	Rylands, Sons, & Co., Limited, Wigan.	Gidlow and Swinley	Ditto	Henry E. Gregory	4	–	4	
116	Scowcroft, John, & Co., Limited, Hindley Green, Wigan.	Hindley Green	Hindley Green	James Clarke	8	1	9	
117	Ditto	Grammar	Ditto	William Meadows	3	–	3	
118	Ditto	Engine	Ditto	Ellis Drinnan	1	–	1	
119	Ditto	Stonehouse	Ditto	Thomas Oakes	1	–	1	
120	Skelmersdale, Lord, Skelmersdale	Blaguegate	Skelmersdale	Ralph Welch	3	–	3	
121	Ditto	Park	Ditto	Ditto	–	–	–	

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1873, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
122	Smethurst, Hoyle & Grime, Ashton, Wigan.	Garswood Hall	Ashton	Joseph Emmison	5	–	5	
123	Ditto	Brynn Moss	Wigan	James McGeevor	1	–	1	
124	Ditto	Elms	Ditto	James Ashworth	2	–	2	
125	Ditto	Holme House	Ditto	Ditto	–	–	–	
126	Stock, Samuel, Ashton, Wigan	Blackleyhurst	Ashton	William Callon	2	–	2	
127	Ditto	Leyland Green	Ditto	Ditto	2	–	2	
128	Ditto	Senela Green	Ditto	Ditto	1	–	1	
129	Stone, Thomas, & Son, Ashton, Wigan.	Downal Green	Ditto	Thomas Hodgkiss	2	1	3	
130	St. Helens Colliery Co., Limited, St. Helens.	Ravenhead	St. Helens	Francis France	6	1	7	
131	Ditto	Deep Pits	Ditto	Ditto	5	1	6	
132	Ditto	Alexandra	Ditto	Ditto	1	–	1	
133	Tawd Vale Coal Co., Limited, Skelmersdale.	Tawd Vale	Skelmersdale	R. Dickinson	3	2	5	
134	Ditto	Park	Ditto	Ditto	–	–	–	
135	Turner, W. and J., Wigan	Mesnes	Wigan	William Turner	9	1	10	
136	Twist, William Parr, St. Helens	Union	St. Helens	William Twist	1	–	1	Manager not certificated; less than 30 persons employed.
137	Victoria Colliery Co., Limited, Rainford, St. Helens.	Victoria	Rainford	William Wardle	1	2	3	
138	Walmsley, William, Hindley Green, Wigan.	Grange Hall	Hindley Green	Edward Lane	1	–	1	
139	West Lancashire Collieries and Fire-clay Works, Limited, St. Helens.	Giller's Green	St. Helens	R. H. Norton	2	–	2	
140	Wigan Coal and Iron Co., Limited, Wigan.	Aspull Pumping	Aspull	C. G. Jackson	1	–	1	
141	Ditto	Bradshaw	Ditto	Ditto	2	–	2	
142	Ditto	California	Ditto	Ditto	9	3	12	
143	Ditto	Crawford	Ditto	Ditto	5	1	6	
144	Ditto	Kirkless	Ditto	Ditto	1	1	2	
145	Ditto	Moor	Ditto	Ditto	–	–	–	
146	Ditto	Woodshaw	Ditto	Ditto	–	–	–	

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
147	Wigan Coal and Iron Co., Limited, Wigan.	Bawkhouse	Haigh	C. G. Jackson	–	–	–	Pumping station.
148	Ditto	Bridge	Ditto	Ditto	–	–	–	Do.
149	Ditto	Gorses	Ditto	Ditto	–	–	–	
150	Ditto	Lindsay	Ditto	Ditto	6	2	8	
151	Ditto	Meadows	Ditto	Ditto	–	–	–	
152	Ditto	Morris Lane	Ditto	Ditto	–	–	–	Not working.
153	Ditto	Alexandra	Ditto	Ditto	9	–	9	
154	Ditto	Tucker's Hill	Ditto	Ditto	–	–	–	Do.
155	Ditto	Wash	Ditto	Ditto	1	–	1	Do.
156	Ditto	William	Ditto	Ditto	–	–	–	Do.
157	Ditto	Godfrey	Ditto	Ditto	–	–	–	Do.
158	Ditto	Gullet	Ditto	Ditto	–	–	–	Do.
159	Ditto	Deep	Hindley	Ditto	3	–	3	
160	Ditto	Ladies Lane	Ditto	Ditto	3	–	3	
161	Ditto	Penny Gate	Ditto	Ditto	–	–	–	
162	Ditto	Holland	Upholland	Samuel Birrell	2	2	4	
163	Ditto	Prospect	Standish	James Hilton	2	–	2	
164	Ditto	Swire	Ditto	Ditto	1	–	1	Not working.
165	Ditto	Gidlow	Ditto	Ditto	3	–	3	
166	Ditto	Broomfield	Ditto	Ditto	–	1	1	
167	Ditto	Langtree	Ditto	Ditto	–	–	–	
168	Ditto	Tunnel	Ditto	Ditto	–	–	–	
169	Ditto	Taylor	Ditto	Ditto	–	1	1	
170	Ditto	John	Ditto	Ditto	2	–	2	
171	Ditto	Giant's Hall	Ditto	Ditto	–	–	–	
172	Ditto	Robin Hill	Ditto	Ditto	2	–	2	Not working.
173	Ditto	Shevington	Ditto	Ditto	4	–	4	Do.
174	Wigan and Whiston Coal Co., Limited, Wigan.	Platt Lane	Wigan	James Atherton	2	1	3	
175	Ditto	Whiston	Whiston	James Makinson	4	8	12	
176	Ditto	Prescot	Ditto	Peter Edwards	3	–	3	
177	Wigan Junction Colliery Co., Limited, Abram, Wigan.	Wigan Junction	Abram	Vincent Heyes	–	–	–	Sinking.
178	Whitemoss Coal Co., Limited, Skelmersdale.	Whitemoss	Skelmersdale	William Pattison	10	3	13	

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
179	Worthington Hall Coal and Cannel Co., Limited, Worthington, Wigan.	Worthington Hall	Worthington	James Kay	–	–	–	
			DENBIGHSHIRE.					
1	Albert Brick & Coal Co., Rhos., Ruabon.	Albert	Ruabon	John H. Hughes	–	–	–	
2	Barnes, J. G. and W., Wrexham	Bersham	Wrexham	W. Drinnan	1	–	1	
3	Black Park Colliery Co., Limited, Chirk.	Black Park	Chirk	Joseph H. Newby	3	–	3	
4	Broughton Coal Co., Wrexham	Broughton	Wrexham	David Pryde	3	1	4	
5	Ditto	Gatewen	Ditto	Ditto	1	–	1	
6	Brynkinalt Colliery Co., Limited, Chirk.	Brynkinalt	Chirk	S. W. Jones	2	1	3	
7	Cae-pen-ty Colliery Co., Limited, Ffrwd, Wrexham.	Cae-pen-ty	Wrexham	Philip Young	–	–	–	
8	Clayton, Thomas, Wrexham	Brynmally	Ditto	Owen Price	5	–	5	
9	Ditto	Pendwll	Ditto	Ditto	3	8	11	
10	Ditto	Gwersyllt	Ditto	Ditto	4	–	4	
11	Darby, W. H., Brymbo, Wrexham	Brymbo	Ditto	John Owens	2	–	2	Not working.
12	Ditto	Penrhos	Ditto	Ditto	1	–	1	
13	Ditto	Smelt	Ditto	Ditto	–	1	1	
14	Dennis, Henry, Ruabon	Legacy	Ruabon	-	–	–	–	Not working.
15	Edwards, J. C., Trevor, Ruabon	Trefynant	Ditto	Thomas Hughes	–	–	–	Manager not certificated; less than 30 persons employed.
16	Evans, Joseph, Rhos, Ruabon	Plasbennion	Ditto	Joseph Evans	–	–	–	Do.
17	Evans, Price, Cross Keys, Goes, Ruabon.	Pen-y-cae	Ditto	Price Evans	–	–	–	Do.

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1873, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
18	Gardden Lodge Coal, Coke, and Firebrick Co., Limited, Ruabon.	Gardden Lodge	Ruabon	John H. Hughes	3	–	3	
19	Grosvenor Colliery Co., Limited, Coedpoeth, Wrexham.	Grosvenor	Wrexham	Thomas Griffiths	–	–	–	
20	Hughes, Evan, Acrefair, Ruabon	Sycamore	Ruabon	–	–	–	–	Not working.
21	Kenrick and Sons, Ruabon	Wynn Hall	Ditto	–	–	–	–	Do.
22	Llay Hall Coal, Iron, and Coke Co., Limited, Wrexham.	Llay Hall	Wrexham	Thomas Edwards	–	–	–	
23	Marland and Davies, Brymbo, Wrexham.	Pen-y-coed	Ditto	–	–	–	–	Do.
24	New British Iron Co., Ruabon	Wynnstay	Ruabon	Ralph Darlington	10	2	12	
25	Ditto	Acrefair	Ditto	Ditto	–	–	–	
26	Pant Coal, Brick, & Fireclay Co., Rhos, Ruabon.	Erwlwydd	Ditto	Fred. Owen	–	–	–	Manager not certificated; less than 30 persons employed.
27	Plas Kynaston Coal Co., Ruabon	Plas Kynaston	Ditto	George Garside	16	–	16	
28	Plas Power Coal Co., Wrexham	Plas Power	Wrexham	N. R. Griffiths	–	1	1	
29	Pugh, Evan, 1 Russell Street, Cefn Mawr, Ruabon.	Pen-y-bryn	Ruabon	—Pugh	–	1	1	Do.
30	Roberts, Gomar, Ruabon	Brandy	Ditto	John H. Hughes	–	–	–	
31	Ruabon Coal Co., Limited, Ruabon	Hafod-y-bwch	Ditto	A. J. Barratt	19	–	19	
32	Seacome, T. H., Ruabon	Delf	Ditto	Thomas Thomas	–	–	–	Do.
33	Smith, George, Ruabon	Plas Ucha	Ditto	–	–	–	–	Not working.
34	Sparrow, James, and Son, Wrexham	Ffrwd	Wrexham	Thomas Jones	4	1	5	
35	Thomas, Wm., Ponkey, Ruabon	Bankddu	Ruabon	William Thomas	–	–	–	Manager not certificated; less than 30 persons employed.

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
36	Vauxhall Colliery Co., Limited, Ruabon.	Vauxhall	Ruabon	George Saint	2	–	2	
37	Vron Colliery Co., Ld., Wrexham	Vron	Wrexham	Griffith Jones	6	1	7	
38	Ditto	Coedpoeth	Ditto	Isaac Jones	2	–	2	
39	Westminster Brymbo Coal and Coke Co., Limited, Wrexham.	Westminster	Ditto	John Salisbury	10	1	11	
40	Wrexham and Acton Colliery Co., Limited, Wrexham.	Wrexham	Ditto	Jonathan Dodd	5	–	5	
41	Ditto	Acton	Ditto	Ditto	–	–	–	Not working.
			FLINTSHIRE.					
1	Alltami Colliery Co., Limited, Mold	Alltami	Mold	Isaac Ayden	–	–	–	
2	Alyn Bank Colliery Co., Limited, Padeswood, Mold.	Alyn Bank	Ditto	David Evans	–	–	–	
3	Aston Hall Coal Co., Limited, Hawarden, Chester.	Aston Hall	Hawarden	Joseph Newton	–	–	–	
4	Ditto	Pentrobin	Buckley	Ditto	–	–	–	
5	Ditto	Queen's Ferry	Queen's Ferry	Ditto	4	–	4	
6	Bedford Pits Colliery Co., Limited, Mold.	Bedford Pits	Mold	William Lee	–	–	–	
7	Bettisfield Colliery Co., Limited, Bagillt, Flint.	Bettisfield	Bagillt	C. J. Crondace	5	4	9	
8	Bistre United Coal and Cannel Co., Limited, Padeswood, Mold.	Bistre United	Padeswood	A. C. King	–	–	–	Manager not certificated; less than 30 persons employed.
9	Coed Talon Colliery Co., Limited, Coed Talon, Mold.	Coed Talon Main	Coed Talon	William Lea	–	1	1	
10	Ditto	No. 3 Pit	Ditto	Ditto	–	–	–	
11	Ditto	Cae Blydden	Ditto	Ditto	–	–	–	

List of Mines—*continued.*

No. of Colliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
12	Coleshill Colliery Co., Limited, Flint.	Coleshill	Flint	John Reid	–	–	–	
13	Coppa Cannel Co., Limited, Padeswood, Mold.	Coppa	Mold	James Newton	1	–	1	
14	Dublin Main Coal Co., Limited, Northop, Flint.	Dublin Main	Northop	Thomas Johnson	1	–	1	
15	Elliott, Sir George, Bart., Holywell	Hanmer	Holywell	M. Bambrough	3	–	3	
16	Englefield Colliery Co., Holywell	Englefield	Ditto	Edward Jones	1	1	2	
17	Flint Marsh Colliery Co., Limited, Flint.	Flint Marsh	Flint	William Tattley	2	–	2	
18	Flintshire Oil and Cannel Co., Limited, Tryddyn, Mold.	Tryddyn	Mold	–	–	–	–	Not working.
19	Hancock, Wm., Buckley, Chester	Spon Green	Buckley	Joseph Newton	1	–	1	
20	Ditto	Lexham Green	Ditto	Ditto	–	1	1	
21	Hawarden Collieries Co., Buckley, Chester.	Hawarden	Ditto	John B. Gregory	4	–	4	
22	Hazlewood Coal and Cannel Co., Coed Talon, Mold.	Hazlewood	Coed Talon	J. H. Green	–	–	–	Manager not certificated; less than 30 persons employed.
23	Humphries, Robert, Coed Talon, Mold.	Plas-y-Mowys	Ditto	Robert Humphries	–	–	–	Do.
24	Jones, David, exors. of, Bagillt, Flint.	Wern	Bagillt	Matthew Francis	–	–	–	
25	Leeswood Cannel and Gas Coal Co., Limited, Leeswood, Mold.	Leeswood Green	Leeswood	–	2	–	2	Not working.
26	Lilleshall Coal and Iron Co., Limited, Shropshire.	Hope	Wrexham	James Atherton	2	1	3	

List of Mines—*continued.*

No. of olliery.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Certificated Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
27	Mold Argoed Colliery Co., Limited, Mold.	Mold Argoed	Mold	Wm. Hopwood	3	1	4	
28	Mostyn Coal & Iron Co., Limited, Mostyn.	Mostyn	Mostyn	Thos. Gittens	3	1	4	
29	Ditto	Eyton	Ditto	Ditto	2	–	2	
30	Nerquis Coal and Cannel Co., Mold	Nerquis	Mold	Charles Hales	1	–	1	
31	New Connah's Quay Chemical and Coal Co., Limited, Queen's Ferry.	Eleanor	Queen's Ferry	J. E. Lowrey	4	–	4	
32	North Coed Talon Cannel & Coal Co., Coed Talon, Mold.	North Coed Talon	Coed Talon	Swainson Taylor	–	–	–	
33	Oak Pits Colliery Co., Limited, Mold.	Oak Pits	Mold	Jonathan Piggford	3	–	3	
34	Padeswood United Coal and Cannel Co., Limited, Padeswood, Mold.	Padeswood	Padeswood	James Hawkins	–	–	–	
35	Parry, Edward, Buckley, Chester	Ewloe Hall	Buckley	–	2	–	2	Not working.
36	Rowlands, John & Co., Buckley, Chester.	South Buckley	Ditto	Thomas Roberts	2	–	2	Manager not certificated; less than 30 persons employed.
37	Russell, A., 49, Finsbury Square, London.	Galchog	Northop, Flint	J. F. Ramsden	–	–	–	Not working.
38	Sandycroft Colliery Co., Buckley, Chester.	Sandycroft	Buckley	Emanuel Defty	1	–	1	
39	Thompson, Edward, & Co., Mold	Llong	Mold	Thos. Ollis	1	–	1	
40	Watkinson, George, and Sons, Limited, Buckley, Chester.	Elm	Buckley	Isaac Hopwood	1	2	3	
41	Ditto	Maes-y-greg	Ditto	Ditto	–	1	1	
42	West Mostyn Colliery Co., Limited, Mostyn.	West Mostyn	Mostyn	–	2	–	2	Not working.
43	Wright, Joseph, Mancot, Hawarden, Chester.	Mancot	Hawarden	Joseph Wright	–	–	–	Manager not certificated; less than 30 persons employed.

LIST OF MINES classed under the METALLIFEROUS MINES REGULATION ACT in MR. HALL'S DISTRICT, 1878.

No. of Mine.	Owner or Company, and Postal Address.	Name of Mine or Colliery.	Where situate.	Name of Manager.	Deaths from Jan. 1st, 1878, to Dec. 31st, 1877.	Deaths in 1878.	Total.	Remarks.
1	Marsh, William, Dalton, Wigan -	Crisp Delf - -	Dalton - -	Thomas Marsh - -	–	–	–	Stone quarry.
2	Melling, James, Billinge, Wigan -	Bispham - - -	Billinge - -	James Melling - -	–	1	1	Do.

OFFICIAL FORMS and NOTICES under the COAL MINES REGULATION ACT, 1872, namely, 1st of January Return; 1st of February Return; Register of Boys, Young Persons, Girls, &c.; School Certificate; Notices relating to District Board for appointing Examiners, and to Examinations for Certificates of Competency; Notice relating to Applicants for Certificates of Service.

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. Cap. 76. Sect. 69. and Schedule 4.

Annual Return from Owner or Agent.

This Form to be filled up and sent to the Inspector of the District on Jan. 1, 1874 and every following year.

Name of Colliery_____ Pit_____ Name of Seam_____.

Year ending the___day of_____187___.

Average Number of Persons employed daily.		Mode of Ventilation	Furnace or Fan, with Description.	Diameter and Depth of downcast and upcast Shafts.				Number of Splits and Quantity.		Average Length of Airways.	Sectional Area of Airways.	Average Total Quantity of fresh Air in cubic feet per minute.
				Downcast.		Upcast.						
Above Ground.	Under Ground.			Diameter in feet.	Depth in feet.	Diameter in feet.	Depth in feet.	Splits.	Quantity in cubic feet per minute.			

Name of the Owner or Company_____ Where situated_____

This Form to be filled up and sent to the Inspector of the District on or before 1st February every year.

COAL MINES REGULATION ACT, 35 & 36 Vict. c. 76. s. 38.

Name of the Mine or Colliery_____

Situation of Mine_____

County_____

Name of Owner (Company)_____

RETURN of PERSONS ordinarily employed during the Year ending 31 December 187 .

Under ground	Boys of 10 and under 12		
	Boys of 12 and under 13		
	Male young persons of 13 and under 16		
	Males above 16		
	Total under ground		
Above ground	Boys of 10 and under 13		
	Girls do.		
	Male young persons of 13 and under 16		
	Female do. do.		
	Women above 16		
	Males do.		
	Total above ground		
	Total number of persons employed in the mine both under ground and above ground		

Quantity of Mineral wrought during the Year ending 31 December 187 .

Mineral wrought.	No. of Tons wrought.
Coal	"
Fireclay	"
Ironstone	"
Oil Shale	"
Alum Shale	"
Copperas Stone	"

day of 187 .

(*Signed*)_____

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 76. s. 13

REGISTER.

_____ *Mine.* _____ *Manager.*

Boys of the age of 10 and under the age of 12 employed below ground.

From day of 18 to day of 18 .

NOTE.—The dates printed in the column headed "Memorandum of Certificates of School Attendance" are the dates of the successive Saturdays in the year 1873.

Upon a FORTNIGHTLY Certificate being received certifying that during the fortnight ending on any one of the printed dates the school attendance of a boy has been such as to satisfy the provisions of the Act, a mark thus —— is to be placed in the space allotted to such date.

Also if during any such fortnight a boy has been employed, but for some cause sanctioned by the Act has not attended school, the cause should be inserted in the space, as "Sick," "School closed," or "No school," as the case may be.

Name.	Age.	Residence.	Date of first Employment.	Memorandum of Certificates of School Attendance.												Remarks.
				Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	
				4 11 18 25	1 8 15 22	1 8 15 22 29	5 12 19 26	3 10 17 24 31	7 14 21 28	5 12 19 26	2 9 16 23 30	6 13 20 27	4 11 18 25	1 8 15 22 29	6 13 20 27	

3 F 2

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 76. s. 13.

_____ *Mine.* _____ *Manager.*

Boys of the age of 12 and under the age of 13 employed below ground.

From day of 18 to day of 18

Name.	Age.	Residence.	Date of first Employment.	Remarks.

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 76. s. 13.

_____ *Mine.* _____ *Manager.*

Male young persons of the age of 13 and under the age of 16 employed below ground.

From day of 18 to day of 18 .

Name.	Age.	Residence.	Date of first Employment.	Remarks.

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 67. s. 13.

_____ *Mine.* _____ *Manager.*

Boys of the age of 10 and under the age of 13 employed above ground.

From day of 18 to day of 18 .

NOTE.—The dates printed in the column headed "Memorandum of Certificates of School Attendance" are the dates of the successive Saturdays in the year 1873.

Upon a FORTNIGHTLY Certificate being received certifying that during the fortnight ending on any one of the printed dates the school attendance of a boy has been such as to satisfy the provisions of the Act, a mark thus —— is to be placed in the space allotted to such date.

Also if during any such fortnight a boy has been employed, but for some cause sanctioned by the Act, has not attended school, the cause should be inserted in the space, as "Sick," "School closed," or "No school," as the case may be.

Name	Age.	Residence.	Date of first Employment.	Memorandum of Certificates of School Attendance.												Remarks.
				Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	
				4 11 18 25	1 8 15 22	1 8 15 22 29	5 12 19 26	3 10 17 24 31	7 14 21 28	5 12 19 26	2 9 16 23 30	6 13 20 27	4 11 18 25	1 8 15 22 29	6 13 20 27	

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 76. s. 13.

_____ *Mine.* _____ *Manager.*

Girls of the age of 10 and under the age of 13 employed above ground.

From day of 18 to day of 18

NOTE.—The dates printed in the column headed "Memorandum of Certificates of School Attendance" are the dates of the successive Saturdays in the year 1873.

Upon a FORTNIGHTLY Certificate being received certifying that during the fortnight ending on any one of the printed dates the school attendance of a girl has been such as to satisfy the provisions of the Act, a mark thus —— is to be placed in the space allotted to such date.

Also if during any such fortnight a girl has been employed, but for some cause sanctioned by the Act has not attended school, the cause should be inserted in the space, as "Sick," "School closed," or "No school," as the case may be.

| Name. | Age. | Residence. | Date of first Employment. | Memorandum of Certificates of School Attendance. | | |

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 76. s. 13.

_____ *Mine.* _____ *Manager.*

Female young persons of the age of 13 and under the age of 16 employed above ground.

From day of 18 to day of 18 .

Name.	Age.	Residence.	Date of first Employment.	Remarks.

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 76. s. 13.

_____ *Mine.* _____ *Manager.*

Women above the age of 16 employed above ground.

From day of 18 to day o 18 .

Name.	Age.	Residence.	Date of first Employment.	Remarks.

COAL MINES REGULATION ACT, 1872, 35 & 36 Vict. c. 76.

SCHOOL CERTIFICATE.

Weekly Certificate.—I hereby certify that the under-mentioned child employed in the mine of _____ _____ situated in _____ has attended the school kept by me at _____ for the number of hours and at the time on each day specified in the columns opposite to his name, during the week ending on Saturday night, the _____ day of _____ one thousand eight hundred and seventy_____ , and that the causes of absence stated are true, to the best of my belief.

Name of Child.	Monday.		Tuesday.		Wednesday.		Thursday.		Friday.		Saturday.		Causes of Absence.
	*Time.		*Time.		*Time.		*Time.		*Time.		*Time.		
	From	To	From	To	From	To	From	To	From	To	From	To	

* When the Schooling begins or ends at a half-hour, the half-hour will be most conveniently inserted in Figures thus—8½—11½, or 1½—4½, in Time Columns.

(Signed) _____ Schoolmaster, the _____ day of _____ 187 .

Fortnightly Certificate.—Also I hereby certify that the attendance of the above-mentioned child at the said school during the fortnight ending on the Saturday night above mentioned, has been such as to satisfy all the provisions of the 8th section of the said Act as abstracted on the back of this Certificate.

(Signed) _____

Every child who by the Coal Mines Regulation Act, 1872, is not allowed to be employed in or about a mine except on condition of attending school during such employment, must, in order to satisfy the provisions of the 8th section of that Act, attend school for at least 20 hours in every fortnight during which he is employed.

Attendance is not to count if—

(*a.*) In excess of three hours at any one time, or five hours in any one day, or of twelve hours in any one week.

(*b.*) On Sundays.

(*c.*) Before 8 a.m. or after 6 p.m.

The non-attendance of any child at School may be excused—

(*a.*) For any time during which the child is certified by the principal teacher of the school to have been prevented from attendance by sickness or other unavoidable cause.

(*b.*) For any time during which the school is closed for the customary holidays, or for some other temporary cause.

NOTICES AS TO CERTIFICATES OF COMPETENCY.

Notice relating to District Boards for appointing Examiners for Managers Certificates of Competency.

Whereas in pursuance of the above-mentioned Act, the Secretary of State for the Home Department has determined that a board for appointing examiners for managers' Certificates of Competency shall be constituted for each district in charge of an inspector of mines, and has accordingly appointed as members of the board of each district—

(*a.*) Three persons being owners of mines to which the above-mentioned Act applies in the district;

(*b.*) Three persons employed in or about a mine to which the said Act applies in the district, not being owners, agents, or managers of a mine ; and

(*c.*) Three persons practising as mining engineers, agents, or managers, or coal viewers in the district.

Notice is hereby given, that the under-mentioned persons have been appointed to act as secretaries to the several boards of examination, for the purpose of the grant of managers' Certificates of Competency under the above Act.

In the examinations regard is had to such knowledge as is necessary for the practical working of mines in the different districts of the United Kingdom.

Applicants desirous of being examined should, therefore, apply for all necessary information to the secretary of that district in which they desire to serve as managers. Persons who do not reside within the district are equally eligible for examination with those who do.

Mining District and Name of the Inspector.	Name and Address of the Secretary to the Board of Examiners.	Month in which Examinations will be held.
Northumberland, Cumberland, and North Durham. (James Willis, Esq.)	George Southern, Esq., Philipson's Buildings, Newcastle-on-Tyne.	January.
South Durham, Westmoreland, and Cleveland. (Thomas Bell, Esq.)	G. W. Bartlett, Esq., Cleveland Parade, Darlington.	July.
North and East Lancashire and Ireland. (Joseph Dickinson, Esq.)	M. W. Peace, Esq., 19, King Street, Wigan.	December.
West Lancashire—the Wigan and St. Helen's Districts, and North Wales. (Henry Hall, Esq.)	M. W. Peace, Esq., 19, King Street, Wigan.	June.
Yorkshire and Lincolnshire. (Frank N. Wardell, Esq.)	John R. Jeffery, Esq., Solicitor, Bradford, Yorkshire.	June.
Derby, Notts, Warwick, and Leicester. (Thomas Evans, Esq.)	Wm. Saunders, Esq., 42, Full Street, Derby.	October.
North Staffordshire, Shropshire, and Cheshire. (Thomas Wynne, Esq.)	Joseph Knight, Esq., Newcastle-under-Lyne, Staffordshire.	June.
South Staffordshire and Worcestershire. (James P. Baker, Esq.)	W. Blakemore, Esq., Heath Town, Wolverhampton.	January.
Monmouth, Gloucester, Somerset, and Devon. (Thomas Cadman.)	J. T. Thomas, Esq., Winnay's Hill, Coleford.	July.
South Wales. (Thomas Wales, Esq.)	C. H. James, Esq., 8, Courtland Terrace, Merthyr Tydfil.	January.
Scotland—Eastern Division. (Ralph Moore, Esq.)	Robert Calder, Esq., 296, Renfrew Street, Glasgow.	May.
Scotland—Western Division. (W. Alexander, Esq.)	C. Macpherson, Esq., 116, St. Vincent Street, Glasgow.	November.

Certificates of Competency.

The fee of an applicant for examination for a certificate of Competency as a manager of a mine is 2*l.*

Any person desirous of being examined must make an application to the Secretary of State in the form hereunder set forth, enclosing therein a post office order for the fee of 2*l.* in favour of F. S. Leslie, Esq., Chief Clerk, Home Office, made payable at the Charing Cross Post Office. The applicant will then receive from the Home Office an authority to present himself for examination before the examiners appointed for the district.

Form of Application for Examination.

Date_____

(*Full postal address*)_____

Sir,

I beg to inform you that I am desirous of presenting myself to be examined by the examiners for the district of for a Certificate of Competency as manager of a mine, and I enclose a post office order for the sum of 2*l.*

I am,
Sir,
Your obedient servant,

To the Right Hon.
the Secretary of State for the Home Department.

Notices.—Certificates of Service.

Notice relating to Applicants for Certificates of Service.

Any person who satisfies the Secretary of State either that before the passing of this Act (10th August 1872) he was acting, and has since that day acted, or that he has at any time within five years before the passing of this Act, for a period of not less than twelve months, acted in the capacity of a manager of a mine, or such part of a mine as can under this Act be made a separate mine for the purposes of this Act, is entitled to a Certificate of Service, which shall have the same effect for the purposes of this Act as a Certificate of Competency granted under this Act.

The fee to be paid by an applicant for a Certificate of service is five shillings.

Any person who is entitled to obtain a Certificate of Service as manager of a mine, and who has not yet obtained it, should *forthwith* make to the Secretary of State an application, accompanied by a statement in manner hereunder set forth, and enclosing a post office order for the fee of five shillings in favour of F. S. Leslie, Esq., Chief Clerk, Home Office, made payable at Charing Cross Post Office.

Form of Application for a Certificate of Service.

SIR,

I BEG to apply for a Certificate of Service as manager of a mine, and enclose a post office order for the sum of five shillings, and a statement containing information upon the required particulars.

I am, Sir,
Your obedient Servant,

To
The Right Hon. the Secretary of State
for the Home Department.

1. Name and address of Applicant for Certificate of Service.	1.
2. Full postal address of applicant.	2.
3. The name of the mine in which (if any) the applicant is acting.	3.
4. The name of the district of the Inspector in which (if in any) the applicant is acting.	4.
5. Place of birth of applicant.	5.
6. Time of birth of applicant.	6.
7. Length and nature of previous service of applicant.	7.
8. Name and address of any person to whom reference may, if necessary, be made for verification of these particulars.	8.

day of

(Signed)_____

CERTIFICATES OF COMPETENCY.

The Board of Examinations for certificates of competency as Colliery managers consists of the following, gentlemen, viz., Messrs. Hewlett, Pilkington, and Robertson, representing the colliery proprietors; Messrs. Bryham, Gilroy, and Clark, representing the mining engineers; and Messrs. Howard, Kennedy, and Ryley, representing the working men.

The three gentlemen appointed by the Board as examiners are Messrs. G. C. Greenwell, Esq., Tynemouth, C. J. Jackson, Esq., Wigan, and N. R. Griffith, Esq., Wrexham.

Examinations under the Coal Mines Regulation Act will be held as follows:—

Northumberland.	January.
Durham.	July.
North Lancashire and Ireland.	December.
West Lancashire and Wales.	June.
Yorkshire.	June.
North Staffordshire.	June.
South Staffordshire.	January.
Derby.	October.
South Wales.	January.
South West.	July.
East Scotland.	April.
West Scotland.	October.

Report of Assistant Inspector.

3, Elm Vale, Fairfield,
Liverpool, 13th March 1879.

Sir,

In pursuance of section 48 of the Coal Mines Regulation Act, 1872, I have the honour to report to you that during the past year I have exercised the duties of Inspector in the District of West Lancashire and North Wales, and that in so doing I have acted as assistant to and under the directions of Mr. Hall, the Inspector for that district.

I have, &c.,
JOHN L. HEDLEY.

To the Right Honourable R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department, Whitehall.

Mr. Cadman's Report.

Report on the Working of the Coal Mines Regulation Act of 1872 (35 & 36 Vict. c. 76.) and of the Metalliferous Mines Regulation Act of 1872 (35 & 36 Vict. c. 77.) in the South-west District, during the year ended the 31st of December 1878.—By Thomas Cadman, Esq.

Sir, Lydney, Gloucestershire, 22nd March 1879.

In compliance with the 48th section of the Coal Mines Regulation Act, and the 20th section of the Metalliferous Mines Regulation Act, I have the honour to report to you upon the working of those Acts in the South-western District during the year 1878, and to transmit the usual Returns for that period.

I will first take the Coal Mines Act, and then the Metalliferous Act, concluding with general remarks upon the working of the entire district under both.

Coal Mines Regulation Act.

Under this Act there are mines in the South-western District, working in the counties of Brecon, Monmouth, Gloucester, Somerset, and Devon, numbering altogether 360 collieries, being less than in the previous year, although there were 81,150 tons of mineral worked more than in 1877. This may be accounted for by stating that most of the mines closed were comparatively small, while several large collieries have been fully opened, and the daily output from them considerably increased during the year. With regard to the number of persons killed, it is my very painful duty to state that the year under notice was by far the worst since the passing of the present Act. Although there was only one fatal explosion of gas, the number killed by that explosion was so great that the calamity has to be ranked amongst the most awful that have ever occurred in the history of coal mining in this country.

The following table gives the number of deaths during the last seven years:—

In 1872, 6 persons were killed by explosions of	fire-damp,	and the total number from all causes was	63
„ 1873, 7	do.	do.	69
„ 1874, 1	do.	do.	64
„ 1875, 32	do.	do.	83
„ 1876, 29	do.	do.	73
„ 1877, 2	do.	do.	53
„ 1878, 268	do.	do.	333

From the above it will be seen that the large number in 1878 was caused by the terrible explosion already referred to. The number of fatal accidents from all causes was higher than the previous year, but not above the average. There was no fatal accident in the ironstone mines worked under this Act.

The following list shows the numbers of deaths in those mines since 1872:—

In 1872, 8	persons	lost their lives.
„ 1873, 3	do.	do.
„ 1874, 7	do.	do.
„ 1875, 3	do.	do.
„ 1876, 1	do.	do.
„ 1877, 2	do.	do.
„ 1878, none	do.	do.

The number of non-fatal accidents in the coal, fire-clay, and ironstone mines reported to me is very nearly the same as last year, as will be seen by the following table:

18	explosions of fire-damp,	injuring	25	persons, more or less.
10	„ of powder,	„	12	„ „
8	accidents on inclines,	„	8	„ „
52	accidents with trams,	„	53	„ „

73 falls of coal,	injuring	74	persons, more or less.
135 falls of top and sides	„	135	„ „
32 miscellaneous accidents underground,	„	35	„ „
24 accidents on surface,	„	24	„ „
352 non-fatal accidents.		366	persons injured.

Many of the accidents reported to me during the year were very slight, as the managers of some mines make a rule of reporting every accident that comes under their notice, however trivial. It is of course difficult to determine at times whether a case is serious or not, and rather than take any responsibility in the matter they report all.

The following were cases which were reported to me during the year, but do not come under the Coal Mines Act. As in former years, however, I name them in my report.

1. On the 9th March, Richard Edwards, aged 56, died suddenly on the surface on his way to work.

2. April 26th, William Jones, 27, hitcher, died in a fit while at his work at Blaina.

3. June 4th, Thomas Phillips, a schoolboy, eight years of age, was killed by a locomotive engine on one of Messrs. Lancaster & Co.'s private railways at Blaina.

4. June 23rd, John Reynolds was drowned while bathing in a pond belonging to the Ashton Vale Iron and Coal Co., near Bristol.

5. July 11th, Thomas Goodwin was playing with other boys in a quarry near the New Tredegar Colliery, and was killed by a tram which they had started down an incline.

6. September 6th, J. Sparkes died suddenly from natural causes in the Easton Colliery.

7. September 24th, Elias Harris, 40, died suddenly from natural causes in the Ashton Vale Colliery.

8. November 30th, Evan Phillips, 14, was killed by a fall of earth while attempting with other children to get some coal in an old patch belonging to the Rhymney Iron Co.

9. December 16th, John Peters died suddenly on the surface at the New Tredegar Colliery. He was not employed there.

10. December 20th, Thomas Morris died suddenly while eating his dinner in No. 22 Colliery, Ebbw Vale, from natural causes.

The quantity of mineral wrought in the district during the year is shown in the following table :—

Counties.	Coal.	Ironstone.	Fire-clay.	Building Stone.
	Tons.	Tons.	Tons.	Tons.
Monmouthshire - - - -	4,491,291	99,793	64,916	7,842
Gloucestershire - - - -	1,139,404	450	2,397	—
Somersetshire - - - -	692,942	3	711	—
Part of Glamorganshire - - -	739,480	349	2,249	—
Part of Breconshire - - - -	89,141	—	—	—
Totals in 1878 - - - -	7,152,258	100,595	70,453	7,842
Totals in 1877 - - -	7,056,136	95,442	89,046	9,374

Giving a total of *7,331,148* tons worked under this Act, as against *7,249,998* tons in 1877.

LIST OF KILLED.

No. on Plan.	Names.	Occupation.	District.	Remarks.
1	James Lovell	Collier	21 District	
2	William Lucy	do.		
3	William Lewis	do.		
4	Edwin Davies	do.		
5	Thomas Davies	do.		
6	Daniel Davies	do.		
7	Henry Owens	do.		
8	George Adams	do.		
9	John Lee	do.		
10	Joseph Hancock	do.		
11	George Watts	do.		
12	John Coker	do.		
13	Thomas Morgan	do.		
14	John Evans	do.		
15	Thomas Evans	do.		
16	John Rowe	do.		
17	Thomas Williams	do.		
18	Solomon John	do.		
19	Jonathan Williams	do.		
20	Benjamin Coward	do.		
21	William James	do.		
22	John Hodges	do.		
23	John Hodges, Jun.	do.		
24	George Giles Coombs	do.		
25	Griffith England	do.		
26	William Downs	do.		
27	John Powell	do.		
28	James Whatley	do.		
29	Frederick Dale	do.		
30	Thomas Nelmes	do.		
31	Henry Nelmes	do.		
32	Henry Quick	do.		
33	Jacob Quick	do.		
34	George Osborne	do.		
35	Thomas Jones	do.		
36	Isaac Watts	do.		
37	John Matthews	do.		
38	George Evans	do.		
39	Thomas Ashman	do.		
40	George Lavell	do.		
41	William Harper	do.		
42	George Shepherd	do.		
43	Robert Osborne	do.		
44	Henry Cartwright	do.		
45	Hall-n Cartwright	do.		
46	William Morgan	do.		
47	James Griffiths	do.		
48	Henry Cowley	do.		
49	John Massey	do.		
50	Thomas South	do.		
51	Joseph Clifford	do.		
52	Henry Clifford	do.		
53	William Arnold	do.		
54	William Preece	do.		
55	David Thomas	do.		
56	Thomas Phillips	do.		
57	Richard Stephens	do.		
58	John Stephens	do.		
59	Isaac Williams	do.		
60	William Gamos	do.		
61	Joseph Hallos	do.		
62	Henry Cunningham	do.		
63	Frederick Stephens	do.		
64	George Meredith	do.		
65	Henry Meredith	do.		
66	Frederick Clutch	do.		
67	George Gifford	do.		
68	Henry Williams	do.		
69	Oliver Hibbs	do.		
70	Edwin Evans	do.		
71	Joseph Moore	do.		Supposed to be with Oliver Hibbs.
72	John Chapman	do.		
73	James Price	do.		
74	Henry Morgan	do.		
75	William Terrell	do.		
76	Job Webb	do.		
77	Thomas Webb	do.		
78	Henry Knight	do.		
79	Thomas Williams	do.		
80	Charles Jones	do.		
81	Thomas Franklin	do.		
82	William Saunders	do.		
83	William Henry Symonds	do.		
84	Samuel Morrison	do.		
	Isaac Salih	do.		
1	Joseph Gay	Overman		
2	Henry Terrell	Fireman		
3	William Young	Roadman		
4	John Cridland	Lampman		
5	William Whatley	Labourer		
6	William Williams	do.		
7	James Beard	do.		
8	John Bakerton	Shackler		
9	George Brooks	do.		
10	Thomas Watkins	do.		
11	Byron Watkins	do.		
12	Albert Wilcox	Rope Cutcher		
13	George Payne	Light Carrier		
14	William Lewis	Master Haulier		
15	Michael Regan	Haulier		
16	John Regan	do.		
17	Thomas Phillips 1st	do.		
18	David Evans	do.		
19	William Phillips 1st	do.		
20	William Phillips 2nd	do.		
21	William Jones 1st	do.		
22	William Jones 2nd	do.		
23	Thomas Jones	do.		
24	George Meadon	do.		
25	William Evan Thomas	do.		
26	William Allen	do.		
27	Gilbert Gloade	do.		
28	Samuel Powell	Sweeper		
29	Henry Nicholas	do.		
30	Alfred Webb	do.		
31	Richard Abram	Door Boy		
32	Frank Whatley	do.		
33	Samuel Terrell	do.		
34	Thomas Phillips 2nd	do.		
35	Elihu Gay	do.		
36	Edwin Williams	do.		
37	Gwylym Evans	Rope Connector		
38	William Terrell	do.		
39	Sydney Watkins	Sweeper		
40	John Carter	Collier		Working place not known.
41	Frederick Chadwick	do.		Ditto ditto
42	Thos. Henry Symonds	do.		Ditto ditto
43	John Evans	do.		Ditto ditto
45a	Silas Smith	Collier		
	James Smith	do.		
46	John Edwards	Collier	22 District	
1	Isaac Madley	Haulier		

LIST OF SAVED.

No. on Plan.	Names.	Occupation.	District.	Remarks.
1	Hezekiah Harvey	Collier.	17 District	
2	Thomas Harvey	do.		
3	Solomon Morgan	do.		
4	Israel Bateman	do.		
5	David Lewis	do.		
6	Samuel Hopkins	do.		
7	Francis Morgan	do.		
8	Thomas Williams	do.		
9	John Lavender	do.		
10	Seth Shergold	do.		
11	Charles Roberts	do.		
12	William Gerrish	do.		
13	Thomas Smith	do.		
14	Alford Davies	do.		
15	Thomas Bryant	do.		
16	William Prosser	do.		
17	John Cook	do.		
18	George Carter	do.		
19	Thomas James	do.		
20	William Pritchard	do.		
21	Thomas Goodings	do.		
22	George Lewis	do.		
23	Benjamin Morgan	do.		
24	William Nicholas	do.		
25	Francis Lewis	do.		
26	George Lewis	do.		
27	Jonah Jones	do.		
28	John Fletcher	do.		
29	John Knight	do.		
30	William Dobbs	do.		
31	John Bater	do.		
32	James Speed	do.		
33	James Nicholas	do.		
34	John Davis	do.		
35	George Moore	do.		
1	James Harris	Fireman		
2	William Davies	Master Haulier		
3	William Davies, Junr.	Haulier		
4	John Edwards	do.		
5	John Williams	do.		
6	John Daniel	do.		
7	Joseph Hooper	do.		
8	David Davies	Shackler		
9	Isaac Matthews	Labourer		
10	William Rosgrove	do.		
11	Thomas Williams	Repairer		
12	Isaac Sheppard	do.		
13	James Sown	do.		
14	Edward Symonds	do.		
15	Thomas Haycock	do.		
1	Joseph Jordan	Fireman	Pit Bottom	
2	Benjamin Gomes	Repairman		
3	Henry Godsby	Haulier		
4	Nicholas Jones	do.		
5	William Hooper	do.		
6	John Beake	do.		
7	Edward Jenkins	Repairer		
8	Henry Powell	do.		
9	James Payne	do.		
10	John Gomm	do.		
11	Thomas Phillips	Repairer		
12	Richard Richards	do.		
13	John Hall	do.		
14	Charles Nicholas	do.		
15	Joseph Cann	do.		
16	John Regan	do.		
17	Charles Cridland	Repairer		
18	William Williams	Shackler		
19	Wm. John Williams	Haulier		

No. on Plan.	Names.	Occupation.	District.	Remarks
25	William Anthony	Collier	2 District.	
26	Thomas Meredith	do.		
27	William Davies	do.		
28	Matthew Morgan	do.		
29	John Morgan	do.		
30	John Owens	do.		
31	Thomas Powell	do.		
32	John Davies	do.		
33	William Davies	do.		
34	Thomas Kidwell	do.		
35	Anthony Jew	do.		
36	John West	do.		
37	William West	do.		
38	Henry Lewis	do.		
39	James Bassett	do.		
40	John Sweet	do.		
41	John Jones	do.		
42	Joseph George	do.		
43	Thomas Waters	do.		
44	William Jenkins	do.		
45	Morgan Morgans	do.		
46	Thomas Allsopp	do.		
	Allsopp	do.		
47	William Williams	do.		
48	John Williams	do.		
49	Richard Edwards	do.		
50	John Evans	do.		
51	Leonel Charles	do.		
52	Daniel Jones	do.		
53	Henry Carter	do.		
54	William Jones	do.		
55	James Absalom	do.		
56	David Absalom	do.		
57	Thomas Jones	do.		
58	Egmanl. Sheppard	do.		
59	John Evans	do.		

Names.	Occupation.	District.
1 George Ashman	Master Haulier	2 District.
2 William Davies	Haulier	
3 Edward Haycock	do.	
4 James Morgan	do.	
5 Morgan Evans	do.	
6 David Williams	Shackler	
7 James Haycock	Roadman	
8 Richard Williams	Dukey Rider	

Names.	Occupation.	District
8 Michael Richards	Repairer	
9 David Davies	do.	
10 Walter Mansfield	Master Boy	
11 Charles Mansfield	Door boy	
12 John Morgan	Oiling	
13 Thomas Osborne	Engineman.	Pit Bottom
14 John Jordan		

MEMORANDA.

	Size of Shaft in Feet.	Area in Square Feet.	Length of Seam in Feet.	Thickness of Seam in Feet.	Inclination of Seam.	Depth from Surface to Seam in Feet.	Number of Men employed in the District.	Number of Horses employed in the District.	Number of Ponies employed in the District.	Remarks.
Main Pit Upcast	20	314								
Cwm Carn Pit Downcast	Diameter	314								
New Air Downcast	12	113								
Nos. 17 District			1,100	12	Level	450	50			17 District
Nos. 18 District			1,100	12	Level	450	50			18 District
Nos. 21 District			1,100	12	Level	450	50			21 District
Nos. 22 District			1,100	12	Level	450	50			22 District
Nos. 4 District			1,100	12	Level	450	50			4 District
Nos. 2 District			1,100	12	Level	450	50			2 District
Ditto ditto 3			1,100	12	Level	450	50			3 District
Ditto ditto 5			1,100	12	Level	450	50			5 District
Ditto ditto 6			1,100	12	Level	450	50			6 District
Ditto ditto 7			1,100	12	Level	450	50			7 District
Ditto ditto

The fatal acidents in the coal, fire-clay, and ironstone mines occurred as follows:—

At Mines belonging to:	No. of Deaths caused by:			Totals.
	Falls.	Explosions of Gas.	Miscellaneous Accidents.	
Ashton Vale Iron Company	1	—	1	2
Bargoed Coal Company	1	—	—	1
Blaenavon Iron Company	3	—	—	3
Coalbrook Vale Coal Company	4	—	1	5
Crown Coal Company	1	—	—	1
Countess Waldegrave	—	—	1	1
David and Sloper	1	—	—	1
Ebbw Vale Steel, Iron, and Coal Company	11	268	2	281
Evans, Wm., Esq.	—	—	1	1
Edford Coal Company	1	—	—	1
Farringdon Coal Company	—	—	1	1
Hollwey, Ch., Esq.	—	—	1	1
Hill and Company	1	—	—	1
Jacob and Company	1	—	—	1
London and South Wales Company	1	—	—	1
Lewis and Morgan	1	—	—	1
Nantyglo and Blaina Company	1	—	1	2
Newport Abercarn Company	—	—	1	1
Price Brothers	—	—	1	1
Prothero, Messrs.	1	—	—	1
Powell's Duffryn Company	1	—	—	1
Rock Coal Company	1	—	—	1
Richards, Willm., Esq.	2	—	—	2
Rhôs Llantwit Coal Company	1	—	—	1
Rhymney Iron Company	4	—	2	6
South Wales Colliery Company	1	—	2	3
Tredegar Iron Company	4	—	4	8
Vipond and Company	1	—	1	2
Westbury Iron Company	1	—	—	1
	45	268	20	333

Explosions of fire-damp.

There was only one fatal explosion of fire-damp during the year, but that was unfortunately one of so terrible an extent that it caused the deaths of 268 persons. It occurred on the 11th of September in the Abercarn Colliery in Monmouthshire.

I will here give a copy of the report upon the case, which in accordance with your instructions I had the honour of transmitting to you.

(Copy)

SIR, Lydney, 30th January 1879.

IN compliance with the Home Office note No. $\frac{77262}{26}$, herewith enclosed, I have the honour to report to you upon the Abercarn Colliery Explosion which occurred on the 11th September last, and by which 268 lives were lost.

At the time of the accident I happened to be within two miles of the colliery, and was sent for immediately it happened, so that I was down the pit within about an hour of the explosion. Unfortunately the timber and coal had taken fire in several places near the shaft bottom, and at at least one point some distance from the pit. The roof had also fallen very heavily, and a large portion of the workings were full of gas.

Everything that was possible was done to extinguish the fires and get into the workings, but the explorers after being down for five or six hours were beaten back by gas and fire upon all sides, and then ascended the shaft for consultation on the surface.

The pit was not left, however, before it had been ascertained that no one could be alive in the workings. At this time I expected a second explosion every moment, as fires were raging at the bottom of the shaft, and the gas was coming out so strong that it would fire at the top of the pit.

As the fires continued to rage, vast masses of black smoke coming up the up-cast pit, it was determined by the engineers present, as the only safe method, to flood a portion of the mine, and so extinguish the fires.

This was commenced the next morning, and it was some weeks after getting out the water again before they were able once more to descend and commence afresh exploring operations. I may say here that the water did not reach many of the bodies, as will be seen by reference to the accompanying map, where the water line is shown. Nearly the whole of the bodies are in the working places indicated by

small numbers in each district on the plan, the reference upon which gives each person's name, showing the place where his body is supposed to be lying.

The district marked No. 2 was comparatively uninjured by the explosion, and all the men working there escaped, but no one came out alive from any other.

When the bottom of the shaft was reached, after the water had been taken out, repairs were immediately commenced, and everything done to reach the bodies of the unfortunate men as quickly as possible. The roadways were cleared night and day, and matters progressed, although slowly, yet apparently surely, until, as I reported to you at the time, the Ebbw Vale Company were compelled, as they stated, through want of means, to stop all operations underground, and now they are simply keeping the pumping engine at work, so as to prevent the mine filling with water.

The road coloured blue marked "No. 4 Dukey Road engine plane" on plan was cleared for a distance of about 520 yards from the shaft, and the return airway coloured red, nearly parallel to it, not not quite so far.

The roads on the other side of the shaft marked "Main Dukey Road engine plane" and "Main Return" on plan were cleared not quite 400 yards.

I made very careful examinations of the underground roads as they were cleared from time to time, and everything pointed to the 21st district as the seat of the explosion. Indeed, I think this is evident, and, with the exception of one collier, every witness at the inquest appeared to be of that opinion.

A very careful inquiry was held by Dr. Brewer, the coroner, assisted by Mr. Wheelhouse, Q.C., who was sent down by the Home Office, and lasted 23 days, when the following verdict was returned: "John Hall met his death by an explosion of gas in the Prince of Wales Pit, Abercarn, but how it occurred we have no evidence to prove.

Many of the witnesses spoke of gas having been seen in the No. 4 district on the Friday, Saturday, Sunday, and Monday previous to the explosion, when a "squeeze" or settling down of the roof occurred in a portion of that district, and some falls took place, but others declared that the quantity of gas was comparatively small, and that prompt measures were taken to make the place safe; and that before the Wednesday (the day of the explosion) everything was in working order again. I met the manager of the colliery on the morning of the accident, before it happened, when he told me of the "squeeze" in No. 4, and that some gas had been given off, but that all was then safe and clear.

Gas was also seen at different times in other parts of the mine from time to time, but I think I may safely say that the Abercarn Colliery was about as fiery as any pit that I have ever had anything to do with, and without ample ventilation in all its parts, and the most careful attention to all matters connected with the ventilation, danger would quickly arise.

The 21st district was spoken of as the warmest portion of the colliery, and upon a few occasions gas was seen in the working places, but it invariably appeared that when this occurred the officers of the mine withdrew the men and took the necessary steps to clear the places before the colliers were allowed to re-enter.

Until lately the colliery was worked upon a system known as double stall. Openings were driven in the coal about 16 yards wide, taking two roads—one at each side—as shown upon the rough sketch section marked A. The space between the roads was sometimes only partially filled, and when these stalls had been driven up about 60 yards the place was abandoned and the two mouths of the openings filled up as tightly as possible with the spoil or rubbish.

About two years ago the system of working was however changed to long work, by which means all the coal was wrought with the exception of about 3 feet left up as a roof.

Thus it was thought that less space would be left open in the old workings for any accumulation of gas, and also that the mine would be better ventilated. There were, however, a few places spoken of in evidence which had been bashed or stowed off in the long work and which were not altogether filled. Nevertheless considerable currents of wind passed along the roads outside these stoppings.

In addition to the resident certificated manager at Abercarn, the Ebbw Vale Company employed a certified manager who had the general supervision of all their mines, visiting them all from time to time and checking the other managers.

Mr. Higson, mining engineer of Manchester, also acted as consulting engineer, and I believe was in Monmouthshire about once a month, inspecting Abercarn at most of his visits.

Some few years ago the general ventilation of the colliery was not considered satisfactory, when it was determined to sink a third shaft for the purpose of improving it.

This was done, and the communication with the workings was only completed last April. This pit is shown upon the plan marked Cwmcarn Pit, and is sunk to a depth of about 250 yards, being a round shaft 20 feet in diameter.

In my opinion this would have been better arranged as an up-cast or outlet for the air after passing through the workings, but when this was mentioned some time ago I was told that the engineers had decided for the present to make it a down-cast, taking in fresh wind there, joining a current from another pit, and passing to the old up-cast. Of course the cost would have been considerably increased by erecting a ventilating apparatus at the top of the Cwmcarn Pit, and reversing the air currents, but as that is the higher shaft it would have been the natural outlet. Nevertheless, when the Cwmcarn Pit was completed the quantity of wind passing through the workings was increased from 90,000 to 135,000 cubic feet per minute, with the arrangements made, and fresh air was introduced in the working faces. Only one seam of coal was worked, and this quantity was distributed in the workings in that seam. It will be noticed that the 21 district was the furthest away from either of the down-cast pits, and therefore the most difficult to ventilate.

The last time that I inspected that district was in March last when I failed to detect the presence of gas, and all appeared in fair order. It will be observed that this was before the completion of the

roads connecting the workings with the Cwmcarn Pit, and therefore when there was less wind passing through the colliery than afterwards.

Both my assistant and myself have been into the mine since that upon several occasions. I made an inspection chiefly in the return airways on the 21st August, one month before the explosion, when they were in a better condition than I had ever seen them in before. My assistant, after his inspections, has invariably reported finding the working places free from gas as far as he observed.

The mine was worked by three shifts of men—two shifts cutting coal and one repairing.

When it can be avoided I think it is objectionable to have one shift of men following another into their working places without allowing any space of time to intervene, especially in a very fiery mine. The places have to be examined when men are actually in them before one turn goes in.

Nevertheless at Abercarn there were several overmen and firemen in each district, so that all places were usually examined by an official several times each night and day.

With regard to the verdict formed by the Coroner's jury under the circumstances, I think it would have been difficult to have arrived at any other.

The only definite conclusion which they could come to from the evidence was that an explosion had occurred, and that it originated in the 21 district, but it was stated to be free from gas on the morning of the explosion, and as no one has been able to examine that part of the colliery since the accident happened, it is impossible to determine whether any indications exist there which might throw some further light upon the matter. I very much regret that the whole of the mine has not been re-opened.

I stated my opinion before the Coroner that some derangements occurred in the ventilation of the district where the explosion happened, and gas was thereby allowed to accumulate, which it would do in a very short time, and fired at one of the so-called safety lamps in use. The lamps are those generally used in Monmouthshire and South Wales. The mine was very dusty, and to this fact I attribute the disaster extending over nearly the whole colliery.

The coal worked at Abercarn is more bituminous than most of the Welsh steam coals worked, and the fine dust upon the roadways at a high temperature would increase the explosive mixture and therefore add to the force of the explosion immensely, carrying the fire beyond the limits to which it would have reached if simply the mixture of fire-damp and air had been ignited.

Blasting was strictly prohibited in the mine, and excepting at the one lamp station in the mine and at the bottom of the down-cast pit all lamps were kept carefully locked. It appears that in years gone by large and sudden outbursts of gas have ocurred in the colliery completely filling the workings with an explosive mixture, and the managers believe such an outburst must have occurred in the 21 district on the 11th September. I am, however, more inclined to believe that some derangement of the ventilation occurred, allowing the air to pass into the return ways before passing through the faces, and gas accumulated.

I am, &c.,

The Right Honourable R. A. Cross, M.P., (Signed) Thos. Cadman.
Home Office, Whitehall.

With regard to the fact of the explosion having extended over nearly the whole mine, I may say that when the gas became ignited in the 21 district, possibly by a defective lamp, the fire was fed by the dust upon the roads, and any gas in the old workings travelling from district to district until the whole of the workings on the north-east sides of the pit had been cleared of all life and the blast reached the two shafts on the Abercarn side.

The plan appended to this report clearly indicates the positions of the different shafts.

After the water was let into the Abercarn shafts and had risen some distance, extending in the workings to about the mark shown on the map, it was found that large quantities of gas continued to ascend through the Cwmcarn Pit. That pit was then covered over, with the exception of a hole through which a pipe was fixed one foot in diameter. The temperature at the top and bottom of the shaft, the barometer at the top, and the quantity of gas passing up the pipe were carefully taken every half hour, from six o'clock in the morning until six at night, from day to day until the water was lowered again to within a short distance of the top of the arches, or roads, at the bottom of the Abercarn shaft.

The following shows the figures taken at 6 a.m., at noon, and at 6 p.m., as supplied by the manager:—

Table showing readings of barometer and thermometer, and quantities of gas ascending Cwmcarn shaft in cubic feet per minute while the water was in the Abercarn Pit, as given by the manager :—

Date.	Taken at 6 a.m.			Taken at Noon.			Taken at 6 p.m.			Remarks.
	Bar.	Ther.	Cubic Feet of Gas.	Bar.	Ther.	Cubic Feet of Gas.	Bar.	Ther.	Cubic Feet of Gas.	
1878.										
Sept. 20	—	—	—	29·46	57	343	29·55	51	338	At 2.30 p.m. on October 8, fresh air going down pipe at a velocity of 500 feet per minute for 5 minutes and at 4·10 for 1½ minute at 395 feet per minute, current also reversed on the 10th October at 2 p.m., and continued for some time. Water was now being rapidly taken out of Abercarn. During the whole time when these readings were taken large quantities of water was being taken out of the workings through Abercarn.
„ 21	29·65	43	376	29·64	54	451	29·64	54	481	
„ 22	29·46	51	—	29·34	52	752	29·25	—	741	
„ 23	29·16	—	588	29·16	50	647	29·17	—	504	
„ 24	28·95	40	320	29·05	60	436	29·10	57	231	
„ 25	29·05	54	752	29·00	56	480	29·03	54	293	
„ 26	29·28	42	225	29·36	56	260	29·39	54	376	
„ 27	29·43	54	402	29·44	60	442	29·45	61	395	
„ 28	29·49	56	505	29·50	65	581	29·48	60	372	
„ 29	29·46	56	502	29·41	58	578	29·33	57	587	
„ 30	29·05	54	255	29·15	58	519	29·23	54	489	
Oct. 1	29·37	44	167	29·40	63	425	29·46	58	112	
„ 2	29·61	44	301	29·63	56	481	29·62	54	523	
„ 3	29·56	46	930	29·58	62	481	29·54	57	302	
„ 4	29·49	54	451	29·49	60	538	29·48	60	494	
„ 5	29·48	54	343	29·47	68	617	29·40	62	662	
„ 6	29·15	58	782	29·14	61	628	29·06	61	526	
„ 7	28·91	—	843	28·88	—	1,049	28·72	—	1,031	
„ 8	28·65	—	494	28·72	—	545	28·80	—	316	
„ 9	28·90	—	526	28·79	—	918	28·70	—	387	
„ 10	28·46	—	742	28·58	—	597	28·80	—	—	
„ 11	28·95	—	564	29·29	—	150	29·44	—	225	
„ 12	29·56	—	240	29·62	58	451	29·63	49	342	
„ 13	29·63	—	418	29·62	—	542	29·57	—	509	
„ 14	29·48	47	633	29·43	57	865	29·32	49	677	
„ 15	29·31	—	511	29·30	—	564	29·32	—	413	
„ 16	29·38	—	564	29·41	—	545	29·41	—	602	
„ 17	29·32	—	1,219	29·32	—	1,764	—	—	—	

Table showing readings of barometer and thermometer for seven days previous to the explosion at Abercarn, taken at the top of Abercarn Pit, 300 feet above sea level, as given by the manager :—

Date.	Time.	Bar.	Ther.	Remarks.
Sept. 4	5 a.m.	29·70	63°	
„	5 p.m.	29·60	71°	
„ 5	5 a.m.	29·50	68°	
„	5 p.m.	29·50	76°	
„ 6	5 a.m.	29·60	66°	
„	5 p.m.	29·60	74°	
„ 7	5 a.m.	29·60	68°	
„	5 p.m.	29·60	68°	
„ 9	5 a.m.	29·60	66°	
„	5 p.m.	29·30	68°	
„ 10	5 a.m.	29·70	62°	
„	5 p.m.	29·70	72°	
„ 11	5 a.m.	29·70	58°	The explosion happened at about 12.15 on the 11th.

List of the explosions, fatal and non-fatal, which have occurred during the year, showing the number of persons killed or injured in each :—

Date.	Colliery.	Owner.	Manager.	Non-fatal.	Fatal.
				No. injured.	Deaths.
1878.					
Jan. 9	No. 3	Tredegar Iron Company	H. Jones	1	—
„ 10	Bedwellty	Ditto	Ditto	1	—
March 11	Ty-Trist	Ditto	Ditto	1	—
„ 27	Rudry	Nicholas and Johnson	Wm. Johnson	1	—
April 9	Malago Vale	Malago Vale Company	T. Garthwaite	1	—
„ 13	Victoria	Ebbw Vale Iron Company.	E. Parry	1	—
„ 20	Wain Llwyd	Ditto	R. Jordan	1	—
„ 22	Ty-Trist	Tredegar Iron Company	H. Jones	1	—
May 13	Garn	Blaenavon Iron Company.	Jos. Kay	2	—
„ 20	Downside	W. Evans, Esq.	W. Evans	1	—
June 1	Bedwellty	Tredegar Iron Company	H. Jones	2	—
July 6	Deep Pit	Coalbrook Vale Company.	Dl. Lewis	1	—
Aug. 29	Henwain	J. Lancaster and Company.	J. Williams	1	—
Sept. 11	Abercarn	Ebbw Vale Iron Company.	C. Pond	—	268
Oct. 8	Coalbrook Vale Co.	Coalbrook Vale Company.	Dl. Lewis	3	—
„ 26	Bedwellty	Tredegar Iron Company	H. Jones	1	—
„ 30	Ditto	Ditto	Ditto	3	—
Nov. 7	Malago Vale	Malago Vale Company	T. Garthwaite	1	—
Dec. 12	Llantwit and Black Vein.	Llantwit and Black Vein Company.	H. Begg	2	—
				25	268

Table showing the state of the barometer and thermometer at different places where non-fatal explosions occurred, as taken at the collieries, giving three days previous to the accidents. Given by the managers :—

Place.	Date.	Bar.	Ther.	Place.	Date.	Bar.	Ther.
Tredegar, 1,050 feet above sea level.	Jan. 7	28·45	45	Ebbw Vale, 907 feet above sea level.	April 11	28·68	45
	„ 8	28·80	41		„ 12	29·00	51
	„ 9	29·07	40		„ 18	28·65	48
	„ 10	29·07	37		„ 19	28·56	54
	Mar. 8	29·00	51		„ 20	28·40	55
	„ 9	29·05	48				
	„ 11	29·12	48	Malago Vale, about 35 feet above sea level.	„ 7	29·90	48
	April 19	28·55	52		„ 8	30·00	47
	„ 20	28·40	52		„ 9	Not given.	
	„ 22	28·70	51		Nov. 5	29·80	51
	May 29	28·07	55		„ 6	29·70	61
	„ 30	29·00	55		„ 7	29·70	55
	„ 31	28·92	57				
	Oct. 24	28·05	52	Coalbrook Vale, about the same elevation as Ebbw Vale.	July 4	29·10	55
	„ 25	28·12	49		„ 5	29·00	62
	„ 26	27·90	49		„ 6	28·85	67
	„ 28	28·62	54		Oct. 7	28·40	—
	„ 29	28·72	45		„ 8	28·20	57
	„ 30	28·60	46				
				Blaenavon, 1,301 feet above the sea.	May 10	28·50	63
					„ 11	28·20	57
					„ 13	28·20	56

Most of the non-fatal cases were very slight, but all explosions have to be reported to me and I give them here with the dates of occurrence. They were all carefully inquired into, and where any violations of the Act of Parliament occurred the matter was reported to you.

In the working of very fiery mines it is desirable, in my opinion, to allow the pit to stand idle for some time in every 24 hours, instead of exerting every effort, as is sometimes done to get out the very largest possible quantity of coal in the day and night by two or more shifts of miners. The men of the second shift often enter their working places before those of the first shift have left them, so that any examination that is made before the second shift enters has to be done while the other men are there.

In the time also the quantity of gas liberated is so great.

Before closing with this subject I will again take this opportunity of directing the attention of owners and managers in the district to the great importance of either closely stowing all the waste and old workings, or so ventilating them as to render them perfectly safe. The first general rule of the Coal Mines Act requires more than the simple ventilation of the working places and the roads leading thereto.

The whole mine must be so ventilated as to render the working places and roads safe, or, in the words of the rule, in a fit state for working and passing therein.

Falls of Roof and Side.

There were 45 deaths caused by falls of coal, roof, and side during the year. This is higher than the previous year.

In working the coals of the district unfortunately there are many persons killed by falls every year, and it is one of the greatest dangers that we have to encounter. I seldom find a scarcity of suitable timber for propping at the mines, and the places are generally well examined before the men enter them in the morning; nevertheless the number of these accidents occurring point to the necessity for the greatest precautions in this matter.

It is of the greatest importance that suitable men should be chosen, to at least take the lead in each working place. There is a danger of comparatively inexperienced colliers being placed together in a stall or road without an old hand amongst them.

On the other hand, I find that the most experienced colliers sometimes get so innured to the dangers met with daily in working underground that they neglect the simplest precautions to guard against them. I have often found men working under overhanging blocks of coal, cutting away the very pieces which support the mineral above them without taking the precaution of placing props or sprags to keep the coal in its place until they are prepared for it to come down. The men are generally supplied with timber for this purpose.

Unfortunately I have more than one case on my death list for 1878 which can be attributed to this cause.

I impress upon the manager the great necessity of maintaining the strictest discipline in all branches of mining, but in no part more so than in guarding against this great source of danger.

Tubs and Trams.

Seven persons were killed by trams or tubs underground during the year under notice as against 11 in 1877. As I mentioned in my last report, in some of the larger collieries each driver or haulier is allowed a door boy to accompany him on his way through the workings to open and close the doors which he passes through with his horse.

These boys often pass and repass the trams while they are in motion, and as might be expected sometimes receive severe injuries, or are at times killed by falling under the tubs. I have called the attention of managers to this danger, and I believe that much has already been done to lessen it. I trust that the present year may be a better one than the last in this as in other receipts, although under this heading the last was much more satisfactory than 1877.

Shaft accidents.

There were five persons killed under this heading during the year. This number includes one man who attempted to cross the bottom of a shaft while the cages were working. He was the onsetter and did so in contravention of the rules of the mine and distinct orders. He was crushed by the descending cage.

Another fell out of a bucket or bowk in a sinking shaft. The pit was only about 20 yards deep. It was afterwards found that on the day of the accident he had little or no food, and was supposed to have fallen out of the bowk in a fit of some kind. Another sinker fell out of a bowk whilst ascending a sinking pit. He was looking down over the side of the bucket, and his head was struck by a piece of timber, causing him to fall.

One man going down alone in a cage is supposed to have stepped out too soon, thinking he had reached the bottom. He fell a considerable distance and was killed.

A banksman fell down a shaft at the South Wales Colliery when the fencing had been temporarily removed.

Miscellaneous accidents.

Two persons died in consequence of being kicked by horses underground. The first, No. 37 on list, was reported to me as a slight accident, inasmuch as the man's thumb was

only broken by the horse, and it was thought that he would speedily recover. Lock jaw however, set in and the poor man died 11 days after the accident.

All the other cases under this heading were more or less accidental, so that it is not necessary for me to further notice them here.

Complaints of workmen.

Upon the receipt of any complaint from workmen, anonymous or otherwise, I have invariably carefully inquired into the case and dealt with it as it required.

Prosecutions.

With your approval the following proceedings were instituted during the year :—

Date.	Defendant.	Violation of	Result.	Fine.	Costs.	Total.
1878.				£ s. d.	£ s. d.	£ s. d.
May 20 -	Owners of the Spero Colliery.	13th General Rule	Convicted -	6 0 0	1 19 0	7 19 0
July 22 -	Wm. Evans, Downside Colliery.	1st do. -	Do.	6 0 0	2 18 0	8 18 0
		23rd do. -	Do.			
		24th do. -	Do.			
		19th do. -	Adjourned and afterwards withdrawn.			
		20th do. -				
„ 30 -	Powell's Duffryn Steam Coal Co.	1st do. -	Convicted -	10 0 0	2 14 0	12 14 0
„ 30 -	Chas. Frame, New Tredegar.	1st do. -	Do.	4 0 0	3 0 0	7 0 0
		6th do. -	Do.			
Dec. 10 -	Wm. Catley, Manager of Rock Colliery.	3rd do. -	Dismissed	—	—	—
		11th Special Rule -				
„ 31 -	Henry Pope, Overman	3rd General Rule -	Convicted	2 0 0	5 14 6	7 14 6
		9th and 11th Special Rules.				

In the case against Mr. Catley, the manager of the Rock Colliery, the magistrates dismissed the case as they were of opinion that as he had published the rules of the mine, that under the circumstances he had fulfilled his duty.

The facts of the case were as follows :—

On the 30th of October I received notice from Mr. Catley that a man had been killed by a fall of stone.

By my directions my assistant visited the colliery and made an inspection underground. I may mention that the mine is worked by means of an adit or level road into the side of the hill so that the men walk in to and out from their work.

It was found upon inquiry that the accident had happened in the early morning before an examination had been made of the workings by the person appointed for that purpose. At the inquest it transpired that workmen sometimes went in if they wished to do so before any inspection had been made, and nothing was done to prevent them, notwithstanding the 11th Special Rule of the mine, which states that,—

"Before each shift of men, and before men *are permitted to* enter the mine, the fireman or "deputy-overman shall examine each working place and the roadway leading thereto, to "see that there is no danger from gas or from roof, or sides or any other contingency that "would render any working place unsafe."

The overman knew that men went in at times before any official; but the manager stated that he did not. He had, however, taken no steps to prevent such a thing happening.

By your directions I afterwards instituted proceedings against Henry Pope, the overman, under the 3rd General Rule, and the 9th and 11th Special Rules, with the result shown in the above table.

The 9th Special Rule states that "They (the overmen and their deputies) and each of "them shall report to the certificated manager or under-viewer any breach of or omissions "to fulfil the provisions of the Act or Special Rules by any person employed in and about "the mine immediately after such breach or omission shall have been discovered."

The two cases against Mr. Evans at first adjourned were afterwards withdrawn upon his undertaking to fully comply with the requirements of the Coal Mines Act.

It will be seen that he was fined for three offences. Under the circumstances, and with the advice of my solicitor, I consented to this course being adopted.

30th General Rule.

I must again say that at very few of the mines in my district the men avail themselves of the permissive power given them by this rule. If this was generally and fully carried out it would not only very much assist the Government Inspector, but also tend to increase the safety of the mines, and, therefore, lessen the number of accidents which we have unfortunately to record from year to year.

Board for examination of Colliery Managers.

It is my painful duty to record the death of the Chairman of this Board, Mr. Abraham Darby, which occurred since I wrote my last report. He was one of the most useful members and very highly respected by all. Taking a great interest in the working of the Board he was a very regular attendant at the meetings.

As the following list of the members will show, you have been pleased to appoint Mr. E. J. Grice, of Newport, in the place of the late Mr. Darby.

The following gentlemen constitute the Board :—

W. B. Naish, Esq., Ston Easton, near Bath.
Edwin Crawshay, Esq., Blaisdon Hall, Gloucestershire.
E. J. Grice, Esq., Newport, Monmouthshire.
Wm. Needham, Esq., Newport, Monmouthshire.
C. A. Harrison, Esq., Fishponds, Bristol.
J. T. Thomas, Esq., Coleford, Gloucestershire.
Mr. Wm. Burchall, Ebbw Vale, Monmouthshire.
Mr. John Jones, Ebbw Vale, Monmouthshire.
Mr. Dd. Williams, Rhymney, Monmouthshire.

Examiners:

Wm. Needham, Esq., Newport, Monmouthshire.
C. A. Harrison, Esq., Fishponds, Bristol.
J. T. Thomas, Esq., Coleford, Gloucestershire.

Secretary:

J. T. Thomas, Esq., Coleford, Gloucestershire.

The following is a list of the fatal accidents which have occurred in the Coal and Fire-clay Mines in the district during 1878 :—

LIST of the FATAL COAL MINE ACCIDENTS, and LOSS of LIFE arising therefrom, in the SOUTH-WESTERN DISTRICT, consisting of MONMOUTHSHIRE, part of BRECONSHIRE part of GLAMORGANSHIRE, GLOUCESTERSHIRE, HEREFORDSHIRE, WILTSHIRE, and SOMERSETSHIRE, during the Year ending 31st December 1878.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Jan. 1	1	Gomers Level	Monmouthshire	Tredegar Iron Co.	Evan Edwards	Collier	65	Fall of coal	–	1	–	–	–	1
„ 8	2	No. 8 Pit	Do.	Ebbw Vale Steel and Iron Co.	Robt. Huntley	Do.	15	Fall of coal and clod	–	1	–	–	–	1
„ 18	3	Bedwellty Pit	Do.	Tredegar Iron Co.	Robt. Evans	Haulier	27	Injured by trams and died January 24th.	–	–	–	1	–	1
Feb. 4	4	Coalbrook Vale	Do.	Coalbrook Vale Co.	John Jenkins	Furnace-man	63	It is supposed he stepped out of the cage before reaching the bottom, he was going down alone to attend the air furnace on a Sunday afternoon, and was found dead at the bottom.	–	–	1	–	–	1
„ 4	5	Golynos	Do.	W. M. Richards	John Williams Henry Williams	Collier Do.	38 28	Fall of coal	–	2	–	–	–	2
„ 7	6	¾ Pit	Do.	Coalbrook Vale Co.	Jos. Jones	Do.	20	Injured by fall of roof and died next day.	–	1	–	–	–	1
„ 8	7	Rhôs Llantwit	Glamorganshire	Rhôs Llantwit Co.	John Tilley	Do.	45	Injured by fall of stone and died on 17th inst.	–	1	–	–	–	1
„ 11	8	New Duffryn	Do.	Rhymney Iron Co.	John Stewart	Sinker	55	Fell out of bowk down shaft. He was looking down over the side while coming up, and his head came in contact with balk of timber.	–	–	1	–	–	1
„ 19	9	Mardy	Monmouthshire	Rhymney Iron Co.	Thos. Davies	Collier	39	Fall of stone	–	1	–	–	–	1
„ 19	10	Wain Llwyd	Do.	Ebbw Vale Co.	Jos. Hancock	Do.	35	Do.	–	1	–	–	–	1
„ 28	11	Lower Deep	Do.	Nantyglo and Blaina Co.	Evan Phillips	Road-man	52	Do.	–	1	–	–	–	1
Mar. 5	12	New Place	Do.	Messrs. Protheroe	Wm. Collier	Collier	20	Fall of coal	–	1	–	–	–	1
„ 19	13	Edford	Somersetshire	Edford Colliery Co.	Wm. Ashman	Do.	–	Fall of roof	–	1	–	–	–	1
„ 20	14	South Wales	Monmouthshire	South Wales Coal Co.	Robt. Meredith	Do.	39	Do.	–	1	–	–	–	1
„ 23	15	Abercarn	Do.	Ebbw Vale Co.	Robt. George	Do.	60	Fall of coal	–	1	–	–	–	1
„ 25	16	No. 15 Pit	Do.	Do.	Wm. Watkins	Do.	25	Do.	–	1	–	–	–	1

List of Fatal Coal Mine Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
April 3	17	Old Mills	Somersetshire	William Evans	Fred. Austee	Collier	14	He was playing with some gunpowder which he took without the men's knowledge and ignited it, and was killed by the explosion.	–	–	–	1	–	1
„ 6	18	Foss Maen	Monmouthshire	Coalbrook Vale Coal Co.	Wm. Price	Do.	15	Fall of roof	–	1	–	–	–	1
„ 24	19	No. 4 Pitt	Do.	Ebbw Vale Co.	John Morgan	Do.	65	Fall of coal	–	1	–	–	–	1
May 6	20	Henllis	Do.	Hill & Co.	Ed. Watkins	Do.	+	Injured by fall of stone and died May 18th.	–	1	–	–	–	1
„ 8	21	New Tredegar	Do.	Powell's Duffryn Co.	Rd. Jones	Do.	19	Fall of roof	–	1	–	–	–	1
„ 21	22	Crown	Gloucestershire	Crown Colliery Co.	–	Do.	–	Fall of rubbish	–	1	–	–	–	1
„ 23	23	Lower Level	Monmouthshire	Rhymney Iron Co.	Henry Thomas	Furnace-man	63	Fell on some rails and broke his ribs; died on 25th.	–	–	–	1	–	1
„ 24	24	No. 7 Pit	Do.	Tredegar Iron Co.	Henry Harris	Sinker	42	This man was supposed to have had a fit, he had been drinking heavily for some time and had taken little or no food the day of the accident; he had only been at the bottom a minute or two and started to come up again when he fell out of the bowk. The pit was only about 20 yards deep.	–	–	1	–	–	1
„ 25	25	Middle Pit	Somersetshire	Countess Waldegrave	Phillip Carter	Haulier	–	Killed by trams	–	–	–	1	–	1
„ 30	26	Varteg Hill	Monmouthshire	Jno. Vipond & Co.	John Chilcott	Collier	–	Fall of coal	–	1	–	–	–	1
June 1	27	Glyn Pit	Do.	Ebbw Vale Co.	Wm. Rowles	Do.	–	Injured by fall of clod and died same day.	–	1	–	–	–	1
„ 4	28	Hill Pit	Do.	Blaenavon Iron Co.	Wm. Jones	Do.	23	Injured by fall of stone and died June 26th.	–	1	–	–	–	1
„ 17	29	Ty-Trist	Do.	Tredegar Iron Co.	Eliz. Prothero	Tip-girl	17	This girl was employed cleaning sidings on the surface, and just before the accident was told by the man in charge to move out of the way as he was about to shunt some waggons, she, however, did not do so, and was crushed by them and died immediately.	–	–	–	–	1	1

List of Fatal Coal Mine Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
June 28	30	Glyn Pit	Monmouthshire	Ebbw Vale Co.	Evan Willmott	Repairer	20	Killed by fall of stone	–	1	–	–	–	1
„ 29	31	Mardy	Do.	Rhymney Iron Co.	Thos. Vaughan	Collier	42	Fall of stone	–	1	–	–	–	1
July 5	32	Dodd Slope	Do.	Blaenavon Iron Co.	Thos. Walby	Do.	28	Injured by fall of roof and died same day.	–	1	–	–	–	1
„ 8	33	Little Pit	Do.	Coalbrook Vale Co.	Geo. Jones	Do.	18	Fall of roof	–	1	–	–	–	1
„ 12	34	Ashton Vale	Somersetshire	Ashton Vale Coal Co.	Geo. Bissicks	Overman	44	Do.	–	1	–	–	–	1
„ 31	35	Garn Pit	Monmouthshire	Blaenavon Iron Co.	Hugh Lloyd	Collier	36	Do.	–	1	–	–	–	1
Aug. 10	36	Lower Level	Do.	Rhymney Iron Co.	Daniel Harris	Do.	24	Fall of stone	–	1	–	–	–	1
„ 15	37	Clandown	Somersetshire	Charles Hollwey	Geo. Horler	–	–	Thumb broken by kick from pony and died on 26th of lock jaw.	–	–	–	1	–	1
„ 16	38	Farringdon	Do.	Farringdon Coal Co.	John Rogers	Haulier	18	Injured by trams on incline and died the next day.	–	–	–	1	–	1
„ 16	39	Varteg Hill	Monmouthshire	J. Vipond & Co.	Wm. Davies	Screener	26	The deceased was standing on a railway waggon and directed those above to tip coal down. He neglected to get out of the way and was crushed by the shoot of the screen.	–	–	–	–	1	1
„ 20	40	Clydach	Breconshire	Lewis and Morgan	Wm. Jones	Collier	17	Fall of stone	–	1	–	–	–	1
Sept. 5	41	South Wales	Monmouthshire	South Wales Coal Co.	Jno. Morgan	Onsetter	33	The deceased attempted to cross the bottom of the shaft, contrary to the rules, while it was working, and was killed by the descending cage.	–	–	–	1	–	1
„ 9	42	Whitworth Drift	Do.	Tredegar Iron Co.	Jas. Matthews	Door-boy	13	Crushed by trams and died on the 10th.	–	–	–	1	–	1
„ 11	43	Abercarn	Do.	Ebbw Vale Iron Co.	–	–	–	Explosion of fire-damp. See body of Report.	268	–	–	–	–	268
„ 12	44	Deep Pit	Do.	Coalbrook Vale Co.	W. H. Lewis	Collier	14	Fall of roof	–	1	–	–	–	1
„ 14	45	Cwmlucu	Do.	Ebbw Vale Iron Co.	Thos. Jones	Haulier	22	Do.	–	1	–	–	–	1
„ 21	46	No. 6 Pit	Do.	Do.	Ed. Thomas	Do.	13	Injured by kick from horse and died on the 22nd.	–	–	–	1	–	1
„ 28	47	Wain Llwyd	Do.	Do.	Wm. Powell	Collier	30	Fall of stone and died on 30th	–	1	–	–	–	1

List of Fatal Coal Mine Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Oct. 2	48	No. 8 Pit -	Monmouthshire	Ebbw Vale Iron Co. -	Wm. Price -	Collier -	45	Fall of coal - - -	–	1	–	–	–	1
„ 19	49	Whitworth Drift	Do. -	Tredegar Iron Co. -	Rufus Jones -	Do. -	14	Do. - - -	–	1	–	–	–	1
„ 26	50	Ty-Trist -	Do. -	Do. -	Thos. Carter -	Do. -	60	Fall of roof - - -	–	1	–	–	–	1
„ 29	51	Rock - -	Do. -	Rock Coal Co. - -	John Hopes -	Do. -	41	Fall of stone. The place had not been examined before the accident and the manager was prosecuted. See Report.	–	1	–	–	–	1
Nov. 1	52	Hendredenny -	Glamorganshire	David and Sloper -	Evan Thomas -	Do. -	15	Fall of clod - - -	–	1	–	–	–	1
„ 2	53	Hendre - -	Breconshire -	Jacob & Co. - -	Philip Jones -	Do. -	50	Injured by fall of roof and died on November 6th.	–	1	–	–	–	1
„ 4	54	Ashton Vale -	Somersetshire -	Ashton Vale Iron Co. -	Rd. Cox - -	Driver -	60	Crushed by trams through the rope breaking on an incline and died on the 7th.	–	–	–	1	–	1
„ 5	55	No. 22 Pit -	Monmouthshire	Ebbw Vale Iron Co. -	Evan Francis -	Labourer -	67	Injured by trams and died next day	–	–	–	1	–	1
„ 11	56	Glanravon -	Glamorganshire	Price Brothers - -	Rosser Thomas -	Collier -	24	He was following the journey up an incline when the rope broke, and before he could get out of the way he was caught by the trams and killed.	–	–	–	1	–	1
„ 12	57	Newbury -	Somersetshire -	Westbury Iron Co, -	—Witcombe -	Do. -	–	Injured by fall of top and died in Bath Hospital on December 30th.	–	1	–	–	–	1
„ 15	58	Terrace Pit -	Glamorganshire	Rhymney Iron Co. -	Wm. Jones -	Do. -	48	Fall of coal. Deceased had been cautioned by two men not to go under the coal, but he neglected their warning and was killed.	–	1	–	–	–	1
„ 15	59	Derri - -	Do. -	Bargoed Coal Co. - -	John Lewis -	Do. -	38	Injured by fall of roof and died on the 20th.	–	1	–	–	–	1
„ 21	60	South Wales -	Monmouthshire	South Wales Coal Co. -	Elias Haynes -	Banksman -	38	The night banksman pushed a tram into the pit when the gates were up and fell with it. The gates were pulled up to effect some alterations in the machinery, and deceased had been cautioned. The alterations would only have taken a few minutes.	–	–	1	–	–	1

List of Fatal Coal Mine Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost in Coal Mines.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1878.														
Dec. 3	61	No. 9 Pit, Sirhowy.	Monmouthshire	Ebbw Vale Iron Co. -	Thos. Ridman -	Collier -	64	Ribs broken by a fall of coal and died on the 5th from lungs being punctured.	–	1	–	–	–	1
„ 7	62	Risca Black Vein	Do. -	London and South Wales Coal Co.	Clifford Isley -	Do. -	14	Injured by fall of coal and died next day.	–	1	–	–	–	1
„ 13	63	Celynen -	Do. -	Newport, Abercarn, Co. -	Geo. Tite - -	Door-boy -	13	Killed by falling under trams -	–	–	–	1	–	1
„ 16	64	Whitworth Drift	Do. -	Tredegar Iron Co. -	Job Fox - -	Collier -	52	Fall of stone - - - -	–	1	–	–	–	1
„ 27	65	Lower Deep -	Do. -	John Lancaster & Co. -	T. Meredith -	Screener -	50	Injured whilst moving waggons on the surface and died on 4th January 1879.	–	–	–	–	1	1
								Totals - -	268	45	4	13	3	333

Metalliferous Mines Act.

The following table gives a summary of the mining produce for 1878 in the South-western District.

Kind of Mineral.	Gloucestershire.	Wiltshire and Somersetshire.	Totals.
	Tons.	Tons.	Tons.
Hæmatite - - - - -	67,958	—	67,958
Bath Stone - - - - -	—	146,274	146,274
Lead Ore - - - - -	—	524	524
Totals - -	67,958	146,798	214,756

There were 1,683 persons reported to me as employed in getting these minerals, and of these four were killed.

Table showing the mines in which the fatal accidents occurred, and the cause of death.

Mines owned by	Mineral.	No. killed.	Cause of Death.
The Dowlais Iron Co. - - -	Hæmatite -	2	Falling down shaft.
Messrs. Pictor and Sons - -	Bath Stone -	1	Fall off a crane stage.
„ Wallington - - -	Do. - -	1	Fall off roof.
Total - - -	—	4	

The first case in the above list occurred on the 25th of May, at the Dowlais Iron Co.'s mine in the Forest of Dean.

A cage of men was being wound up on the day in question, and when they reached the surface it was intended to disconnect the drum upon which that rope was being wound, for the purpose of making some alterations. The banksman in charge, however, contrary to all rules, commenced unscrewing the machinery while it was in motion, and while the men were being drawn up the shaft. It is supposed that he did this to save time, but he so far loosened the drum that it became free from the engine, and the cage dropped back down the pit.

Several men were injured but two died from the effects.

The banksman was committed for manslaughter by the Coroner's jury and the magistrates, and was taken to the Gloucester Assizes, where he was bound over to appear again if called upon. He was not actually seen unscrewing the machinery, but it was proved to have been secure just before, and he was the only person near, and was seen running from that direction when the accident happened.

Comparative Table of deaths in the Metalliferous Mines since 1874.

In 1874, 4 persons lost their lives.
„ 1875, 7 „ „
„ 1876, 3 „ „
„ 1877, 8 „ „
„ 1878, 4 „ „

Special Rules.

Although it is not compulsory, at several of the mines special rules have been established during the year which I trust will tend to improve the discipline maintained in the works, and render them less dangerous.

The following is the usual list of the fatal accidents which have occurred at mines worked under this Act during the year :—

LIST of the FATAL METALLIFEROUS MINE ACCIDENTS, and LOSS of LIFE arising therefrom, in the SOUTH-WESTERN DISTRICT, comprising part of GLAMORGANSHIRE, portion of BRECKNOCKSHIRE, all MONMOUTHSHIRE, all GLOUCESTERSHIRE, all HEREFORDSHIRE, all WILTSHIRE, and part of SOMERSETSHIRE, during the year ending 31st December 1878.

Date.	No. of Accidents.	Name of the Mine.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.					
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous.	Underground.	Total.
1878.														
May 25	1	Edge Hill -	Forest of Dean -	Dowlais Iron Co. -	Thomas Moore -	Miner -	42	The cog wheels of the winding engine got out of gear and the cage fell down the pit. This case is noticed fully in the Report.	–	–	2	–	–	2
					Geo. Malsom -	Do. -	45							
June 25	2	Corsham Mines	Wiltshire -	Pictor and Sons - -	C. Elmes - -	Quarryman	26	Fell off the crane stage and died on the 29th.	–	–	–	1	–	1
Dec. 10	3	Limpley Stoke	Do. -	Messrs. Wallington -	Thomas Meaden -	Do.	34	Fall of roof. The stone appeared perfectly safe and gave no indication of danger till it suddenly fell.	–	1	–	–	–	1
								Total killed - -	–	1	2	1	–	4

Total number of persons killed - - 4

General Remarks referring to the whole District under both Acts.

The district comprises :—

Monmouthshire,
Herefordshire,
Gloucestershire,
Somersetshire,
Wiltshire,
Devonshire, with
Parts of Glamorganshire and Breconshire,

and altogether under both Acts there are 433 mines.

I have again to state that at many of the mines the discipline is far from satisfactory. While not actually committing breaches of the Law, there is such a laxity in the working of many places that I am convinced tends to keep the list of accidents above what it should be. If a stricter discipline were maintained it would lessen the dangers of the mines.

At many of the mines, however, an improvement is perceptible, and with the co-operation of masters and men I sincerely trust that we may be able to shorten our accident lists from year to year. Of course there are many pure accidents, but others can, and should be, avoided.

I have been well assisted by Mr. Bain during the year, and we have endeavoured to carry out your instructions, and to see that the law is obeyed. I may observe that during the year we made 458 visits of inspection to mines. Of these 239 were underground, as well as to the surface, and the remainder were visits to mines, inspecting machinery, plans, reports, and surface arrangements generally. We attended 54 inquests, and all the prosecutions on the list, besides assizes, and many other meetings, such as the Examination Board, and with owners and managers respecting their mines, solicitors, &c. Between us we travelled 25,028 miles.

Much of our time during the latter part of the year was occupied at Abercarn. The correspondence is also very heavy.

I here give a list of the mines in the district, with the names of the managers of those worked under the Coal Mines Regulation Act.

I have, &c.,
THOMAS CADMAN.

To the Right Honourable R. A. Cross, M.P.,
Home Office, Whitehall.

Report of Assistant Inspector.

Sir, Newport, Monmouth, March 24th, 1879.

In pursuance of section 48 of the Coal Mines Regulation Act, 1872, and section 20 of the Metalliferous Mines Act, 1872, I have the honour to report to you that during the past year I have exercised the duties of inspector of mines in the South-western District, and that in so doing I have acted as assistant to and under the direction of Mr. Thomas Cadman, the inspector for that district.

I have, &c.,
R. DONALD BAIN.

The Right Hon. R. A Cross, M.P.,
Her Majesty's Principal Secretary of
State, Home Department.

LIST of HÆMATITE MINES in the SOUTH-WESTERN DISTRICT.

No.	Name of Mine.	Situation of Mine.		Name of Owner.
		Post Town.	County.	
1	Aylburton	Lydney	Forest of Dean	James James.
2	Beach Tree Grove	-	Ditto	William James.
3	Birch Hill	Cinderford	Ditto	Edward Foxall.
4	Bob's Quarry	Lydney	Ditto	James James.
5	British	Cinderford	Ditto	H. Crawshay and Sons.
6	Buckshaft	Ditto	Ditto	Ditto.
7	China Engine	Parkend	Ditto	Forest of Dean Iron Co.
8	Clearwell	Cinderford	Ditto	Ditto.
9	Easter	Coleford	Ditto	Easter Iron Ore Co.
10	Forget-me-not	Bream	Ditto	J. W. Blanch.
11	Frog Pit	Ditto	Ditto	William James.
12	Gatewell	Ditto	Ditto	Ditto.
13	Highmeadow	Coleford	Ditto	Highmeadow Coal Co.
14	Noxon Park	-	Ditto	Great Western Coal Co.
15	Oakwood Mill North	Bream	Ditto	Forest of Dean Hæmatite Ore Co.
16	Oak Pit	Coleford	Ditto	Goodrich Langham.
17	Old Bow Pit	Ditto	Ditto	George Atkinson.
18	Old Ham Pit	Ditto	Ditto	W. H. Fryer.
19	Old Park	Bream	Ditto	Richard Watkins.
20	Park Hill	Parkend	Ditto	Parkend Iron Ore Co.
21	Perseverance	Newnham	Ditto	Great Western Iron Co.
22	Scar Pit	Bream	Ditto	William James.
23	Shraves	Ditto	Ditto	John Shingles.
24	Sling	Coleford	Ditto	W. H. Fryer.
25	Slope Pit	Bream	Ditto	Bream Grove Co.
26	Staunton	-	Ditto	Wood and Phillips.
27	Tufton	Newnham	Ditto	G. Atkinson.
28	Westbury Brook	Mitcheldean	Ditto	Dowlais Iron Co.
29	Wigpool	Ditto	Ditto	Lydney and Wigpool Iron Ore Co.
30	Yew Tree	Bream	Ditto	John Shingles.
31	Crescent	Clifton	Gloucestershire	Cooke, Brothers.
32	Oxenhall	Newent	Ditto	J. B. Brown and Co.
33	Pensford	Bristol	Ditto	E. L. Owen.
34	Temple Cloud	Ditto	Ditto	H. J. Hippisley.
35	Doward	Monmouth	Hereford	A. Ridler.
36	East Harptree	Radstock	Somerset	Captain Nichols.
37	Somerset Mines	Ditto	Ditto	Somerset Iron Co.
38	Waldegrave	Ditto	Ditto	Waldegrave Co.

LIST of OOLITE MINES in the SOUTH-WESTERN DISTRICT.

No.	Name of Mine.	Situation of Mine.		Name of Owner.
		Post Town.	County.	
1	Box Hill	Box	Wiltshire	Randall and Saunders.
2	Huddeswell	Ditto	Ditto	Ditto.
3	Ridge Quarry	Ditto	Ditto	Ditto.
4	Westwood	Ditto	Ditto	Ditto.
5	Box Hill	Ditto	Ditto	Isaac Sumsions.
6	Monks Park	Ditto	Ditto	Ditto.
7	Box Quarry	Box	Ditto	Messrs. Noble.
8	Cliff Quarry	Ditto	Ditto	Pictor, Brothers.
9	Spring	Chippenham	Ditto	Ditto.
10	Stoke	Ditto	Ditto	Ditto.
11	Winsley	Ditto	Ditto	Ditto.
12	Corsham Down	Corsham	Ditto	Yockney & Co.
13	Box Hill	Box	Ditto	Gardner and Marsh.
14	Corsham	Ditto	Ditto	Ditto.
15	Farleigh Down	Ditto	Ditto	Ditto.
16	Kingsdown	Ditto	Ditto	Ditto.
17	Hayters Level	Ditto	Ditto	Stone and Sons.
18	Shaft	Ditto	Ditto	Ditto.
19	Thirty Yard Shaft	Ditto	Ditto	Ditto.
20	Level Heading	Farleigh Down	Ditto	Messrs. Rogers.
21	Ditto	Bradford	Ditto	Rogers and Bethell.
22	Quarry Level	Box	Ditto	Messrs. Strong.
23	Ridge	Corsham	Ditto	Messrs. Chapman.
24	Westwood	Bradford	Ditto	W. Godwin.

No.	Name of Mine.	Situation of Mine.		Name of Owner.
		Post Town.	County.	
25	Combe Down - -	Corsham - -	Somersetshire -	Randall and Saunders.
26	Farleigh New - -	Chippenham -	Ditto -	Pictor and Sons.
27	Farleigh, Old - -	Ditto -	Ditto -	Ditto.
28	Green Down - - -	Combe Down -	Ditto -	Stone, Brothers.
29	Level Heading - -	Freshford - -	Ditto -	Ditto.
30	Ditto - -	Ditto -	Ditto -	Messrs. Wallington.
31	Turnpike - - - -	Combe Down -	Ditto -	Randell and Saunders.

List of Lead Mines in the South-western District.

1	East Harptree - -	Radstock -	Somersetshire -	East Harptree Lead Co.
2	Ubley - - -	Wells - -	Ditto -	Charterhouse Mining Co.
3	Waldegrave - -	Radstock - -	Ditto -	Waldegrave Co.

COAL MINES REGULATION ACT, 1872.

LIST of COAL, IRONSTONE, and FIRE-CLAY MINES in the SOUTH-WESTERN DISTRICT.

No.	Name of Mine.	Situation of Mine.		Name of Owner.	Name of Manager.
		Post Town.	County.		
1	Aberbeeg	Aberbeeg	Monmouthshire.	Powell, Brothers	John Edmunds.
2	Abercarn	Abercarn	Ditto	Ebbw Vale Iron and Steel Co.	C. Pond.
	Abersychan :—				
3	Big Pit	Pontypool	Ditto	Ditto	W. P. James.
4	Cwmbwrgwm	Ditto	Ditto	Ditto	Ditto.
5	Cwmnantddû	Ditto	Ditto	Ditto	Ditto.
6	Cwmsychan	Ditto	Ditto	Ditto	Ditto.
7	Glannantddû	Ditto	Ditto	Ditto	Ditto.
8	Greenland	Ditto	Ditto	Ditto	Ditto.
9	Peter's Pit	Ditto	Ditto	Ditto	Ditto.
10	Arall	Aberbeeg	Ditto	T. Latch	M. McArthy.
11	Barcella	Ditto	Ditto	Ditto	Ditto.
12	Berris	Pontllanfraith	Ditto	T. Stroud	T. Stroud.
	Blaenavon :—				
13	Brickyard Level	Blaenavon	Ditto	Blaenavon Iron Co.	P. Williams.
14	Cinder Pit	Ditto	Ditto	Ditto	Ditto.
15	Coity Pit	Ditto	Ditto	Ditto	Ditto.
16	Coity Level	Ditto	Ditto	Ditto	Ditto.
17	Dodd's Slope	Ditto	Ditto	Ditto	Ditto.
18	Forge Pit	Ditto	Ditto	Ditto	Ditto.
19	Forge Slope	Ditto	Ditto	Ditto	Ditto.
20	Garn Pit	Ditto	Ditto	Ditto	Ditto.
21	Hill Pit	Ditto	Ditto	Ditto	Ditto.
22	Kay's Slope	Ditto	Ditto	Ditto	Ditto.
23	New Slope	Ditto	Ditto	Ditto	Ditto.
24	Patches	Ditto	Ditto	Ditto	Ditto.
25	Wainavon	Ditto	Ditto	Ditto	Ditto.
26	Blaencuffin	Aberbeeg	Ditto	Powell, Brothers	D. Phillips.
	Blaendare :—				
27	Clay Slope	Pontypool	Ditto	Blaendare Coal Co.	James Cadman.
28	Glyn Level	Ditto	Ditto	Ditto	Ditto.
29	Lower Level	Ditto	Ditto	Ditto	Ditto.
30	Blaensychan	Ditto	Ditto	Morgan Charles	Morgan Charles.
31	Blaenycwm	Ditto	Ditto	T. Davies	T. Davies.
32	Blaenycwm	Ditto	Ditto	Blaenycwm Coal Co.	L. Nicholas.
33	Bovil	Machen	Ditto	W. and E. Beddoe	E. Beddoe.
34	Bovil Sun Level	Ditto	Ditto	Ditto	Ditto.
35	Bryn Gwyn	Bedwas	Ditto	W. S. Cartwright	Thos. Thomas.
36	Bush	Crumlin	Ditto	Bush Coal Co.	(Not working.)
37	Cefn-y-Crib	Pontypool	Ditto	Blaenycwm Coal Co.	Ditto.
38	Celynen	Abercarn	Ditto	Newport Abercarn Coal Co.	J. T. Green.
	Coalbrook Vale :				
39	Coke Yard	Nantyglo	Ditto	Coalbrook Vale Coal Co.	D. Lewis.
40	Deep Pit	Ditto	Ditto	Ditto	Ditto.
41	Fosmaen	Ditto	Ditto	Ditto	Ditto.
42	Little Pit	Ditto	Ditto	Ditto	Ditto.
43	Three Quarter Pit	Ditto	Ditto	Ditto	Ditto.
44	Coedcae Tillery	Abertillery	Ditto	P. S. Phillips	T. P. Stewart.
45	Cwm	Aberbeeg	Ditto	Cwm Colliery Co.	J. Stanfield.
46	Cwmbran	Cumbran	Ditto	Patent Nut & Bolt Co.	J. Jacob.
47	Cwmbran Brickworks	Ditto	Ditto	H. Parfitt	T. Davies.
48	Cwmbyr	Risca	Ditto	E. Jones	E. Jones.
49	Cwmdows	Pontllanfraith	Ditto	T. Stroud	T. Stroud.
50	Cwmfarm	Abertillery	Ditto	J. Wallace	J. Wallace.
51	Cwmfrwdoer	Pontypool	Ditto	Pontypool Coal & Brick Co.	G. H. Daniel.
52	Cwmgelly	Blackwood	Ditto	D. Thomas	T. Cosslett.
53	Cwmglo	Bedwas	Ditto	Marland and Davies	J. Lewis.
54	Cwmnantygroes	Abertillery	Ditto	Clapp and Williams	P. A. Williams.
55	Cwmnantygwint	Aberbeeg	Ditto	Penyvan Coal Co.	(Not working.)
56	Darran	Risca	Ditto	J. Jones	G. Nicholas.
57	Drissiog	Hengoed	Ditto	Lewis, Bros.	L. Lewis.

List under the Coal Mines Regulation Act—*continued.*

No.	Name of Mine.	Situation of Mine.		Name of Owner.	Name of Manager.
		Post Town.	County.		
	Ebbw Vale :—				
58	Farm Level, No. 1	Ebbw Vale	Monmouthshire.	Ebbw Vale Steel & Iron Co.	Jas. Powell.
59	„ No. 2	Ditto	Ditto	Ditto	Ditto.
60	Fire-clay Level, No. 1	Ditto	Ditto	Ditto	Ditto.
61	„ No. 2	Ditto	Ditto	Ditto	Ditto.
62	Forge Level	Ditto	Ditto	Ditto	Ditto.
63	Glynnantddu	Ditto	Ditto	Ditto	Ditto.
64	No. 2 Tunnel	Ditto	Ditto	Ditto	Ditto.
65	No. 6 Pit	Ditto	Ditto	Ditto	Ditto.
66	No 8 „	Ditto	Ditto	Ditto	Ditto.
67	No. 15 „	Ditto	Ditto	Ditto	Ditto.
68	No. 19 „	Ditto	Ditto	Ditto	Ditto.
69	No. 22 „	Ditto	Ditto	Ditto	Ditto.
70	Soap Vein	Ditto	Ditto	Ditto	Ditto.
71	Ellid	Newport	Ditto	Beynon & Co.	(Not working.)
72	Gelly	Maesycwmmer	Ditto	Lewis, Brothers	— Lewis.
73	Gelly	Pontypool	Ditto	Darby and Morris	(Not working.)
74	Gelly deg	Maesycwmmer	Ditto	Kenway & Wyatt	Ditto.
75	Gelly deg	Ditto	Ditto	Prosser & Co.	— Prosser.
76	Gelly deg Issaf	Ditto	Ditto	Daniel Richards	D. Richards.
77	Gellydwylt	Blackwood	Ditto	D. Lewis	T. Price.
78	Gelly groes	Pontllanfraith	Ditto	Gellygroes Colliery Co.	G. Williams.
79	Gelly haf	Fleur de Lis	Ditto	H. F. Jones	T. Jones.
80	Gelly haf	Ditto	Ditto	Harris & Co.	— Harris.
81	Gelly haf Issaf	Ditto	Ditto	W. Moor & Co.	D. Treasure.
82	Glyngaer	Blackwood	Ditto	E. D. Williams	E. D. Williams.
83	Glynsychan	Pontypool	Ditto	— Phillips	
84	Golynos	Abersychan	Ditto	W. M. Richards	J. Needham.
85	Golynos Slope	Ditto	Ditto	Ditto	Ditto.
86	Green Meadow	Abertillery	Ditto	T. Robins	T. Robins.
87	Gwailodywain	Pengarn	Ditto	Bevan and Pryce	T. Ellis.
88	Gwaina Borga	Blackwood	Ditto	Rock Coal Co.	W. Catley.
89	Goorhay	Ditto	Ditto	D. Lewis & Co.	(Not working.)
90	Gwerna	Maesycwmmer	Ditto	Nurse and Phillips	Ditto.
91	Hafod Trisylod	Abertillery	Ditto	J. P. Price	H. Morgan.
92	Hafod Van	Ditto	Ditto	Ditto	Ditto.
93	Hafodyrynys	Crumlin	Ditto	Evan Jones	E. Jones.
94	Henllis	Newport	Ditto	Hill & Co.	E. S. Jones.
95	Hollybush	Blackwood	Ditto	E. D. Williams	E. D. Williams.
96	Kendon	Crumlin	Ditto	C. Morgan	C. Morgan.
97	Llanarch	Newbridge	Ditto	J. Partick	J. Partick.
98	Llandavel	Aberbeeg	Ditto	Monmouth Coal and Coke Co.	J. Stanfield.
99	Llanhilleth	Ditto	Ditto	Powell, Brothers	H. Harris.
100	Maesycwmmer Junction	Maesycwmmer	Ditto	Mathews and Evans	J. R. Mathews.
101	Mammole	Blackwood	Ditto	Mammole Colliery Co.	T. Stewart.
102	Milfraen	Brynmawr	Ditto	Jayne & Co.	E. Evans.
	Nantyglo :—				
103	Beaufort Water Level	Nantyglo	Ditto	John Lancaster	J. Williams.
104	Forge Pit	Ditto	Ditto	Ditto	Ditto.
105	Globe „	Ditto	Ditto	Ditto	Ditto.
106	Griffin „	Ditto	Ditto	Ditto	Ditto.
107	Henwain „	Ditto	Ditto	Ditto	Ditto.
108	Lower Deep	Ditto	Ditto	Ditto	Ditto.
109	Upper „	Ditto	Ditto	Ditto	Ditto.
110	New Tredegar	Cardiff	Ditto	Powell's Duffryn Co.	C. Frame.
111	Old Furnace	Pontypool	Ditto	Morgan Charles	M. Charles.
112	Place New	Pengam	Ditto	Messrs. Prothero	D. Jenkins.
113	„ Old	Ditto	Ditto	Ditto	Ditto.
114	Pontygwaith	Aberbeeg	Ditto	Aberbeeg Coal Co.	R. Richards.
	Pontypool Works :				
115	Cwmlucu	Pontypool	Ditto	Ebbw Vale Steel & Iron Co.	S. Birrel.
116	Glyn Level	Ditto	Ditto	Ditto	Ditto.
117	Glyn Pits	Ditto	Ditto	Ditto	Ditto.
118	Rhoswen	Blackwood	Ditto	Bevan & Price	T. Ellis.
	Rhymney :—				
119	Clay Level	Rhymney	Ditto	Rhymney Iron Co.	D. Abraham.
120	Gwainfawr	Ditto	Ditto	Ditto	Ditto.
121	Lower Level	Ditto	Ditto	Ditto	Ditto.
122	Mardy	Ditto	Ditto	Ditto	Ditto.
123	Ryhmney Pit	Ditto	Ditto	Ditto	Ditto.
124	Risca Black Vein	Risca	Ditto	London & South Wales Coal Co.	E. James.
125	Risca Clay Level	Ditto	Ditto	Ditto	Ditto.

LIST under the COAL MINES REGULATION ACT—*continued.*

No.	Name of Mine.	Situation of Mine.		Name of Owner.	Name of Manager.
		Post Town.	County.		
126	Risca Red and Grey Vein	Risca	Monmouthshire.	London and South Wales Coal Co.	E. James.
127	Risca Brickworks	Ditto	Ditto	F. Jones	F. Jones.
128	Rock	Blackwood	Ditto	Rock Coal Co.	W. Catley.
129	Rock	Ditto	Ditto	J. Davies	J. Davies.
	Sirhowy:				
130	Building Stone Level	Sirhowy	Ditto	Ebbw Vale Steel & Iron Co.	J. N. James.
131	Fire-clay Level	Ditto	Ditto	Ditto	Ditto.
132	No. 2 Pit	Ditto	Ditto	Ditto	Ditto.
133	No. 4 „	Ditto	Ditto	Ditto	Ditto.
134	No. 7 „	Ditto	Ditto	Ditto	Ditto.
135	No. 8 „	Ditto	Ditto	Ditto	Ditto.
136	No. 9 „	Ditto	Ditto	Ditto	Ditto.
137	South Wales	Abertillery	Ditto	South Wales Coal Co.	J. Jones.
138	Cwmtillery Level	Ditto	Ditto	Ditto	Ditto.
139	Soveridd	Crumlin	Ditto	W. Lewis	E. Jones.
140	Sun	Blaina	Ditto	J. Morgan	J. Partick.
141	Tillery	Abertillery	Ditto	Clapp & Williams	P. A. Williams.
142	Tillery Level	Ditto	Ditto	Jayne & Co.	E. Evans.
143	Tillery Pit	Ditto	Ditto	Ditto	Ditto.
144	Tirphil	Tredegar Junction	Ditto	J. P. Jones	J. P. Jones.
145	Tir Philkins (Old)	Newport	Ditto	Powell, Brothers	J. Jeremiah.
146	Tir Philkins (New)	Ditto	Ditto	Ditto	Ditto.
147	Ton-y-Moch	Ditto	Ditto	D. Rees	D. Rees.
148	Tranch	Pontypool	Ditto	Rees and James	— Rees.
	Tredegar:				
149	Ash Tree	Tredegar	Ditto	Tredegar Iron Co.	H. Jones.
150	Bedwellty Pits	Ditto	Ditto	Ditto	Ditto.
151	Bedwellty Levels	Ditto	Ditto	Ditto	Ditto.
152	Darran	Ditto	Ditto	Ditto	Ditto.
153	No. 1 Colliery	Ditto	Ditto	Ditto	Ditto.
154	No. 3 „	Ditto	Ditto	Ditto	Ditto.
155	No. 6 „	Ditto	Ditto	Ditto	Ditto.
156	No. 7 „	Ditto	Ditto	Ditto	Ditto.
157	No. 8 „	Ditto	Ditto	Ditto	Ditto.
158	Patches	Ditto	Ditto	Ditto	Ditto.
159	Ty-Trist, No. 1	Ditto	Ditto	Ditto	Ditto.
160	Ty-Trist, No. 2	Ditto	Ditto	Ditto	Ditto.
161	Whitworth Drift	Ditto	Ditto	Ditto	Ditto.
162	Whitworth, No. 1	Ditto	Ditto	Ditto	Ditto.
163	Whitworth, No. 2	Ditto	Ditto	Ditto	Ditto.
164	Trelyn	Maesycwmmer	Ditto	H. Roberts	H. Roberts.
165	Tygopi	Mynyddysllwyn	Ditto	Evan Morgan	G. Morgan.
166	Ty Llwyd	Pontllanfraith	Ditto	Rees, Brothers	W. Lewis.
167	Ty Mawr	Crumlin	Ditto	D. Lawrence	D. Lawrence.
168	Ty-y-berth	Pontllanfraith	Ditto	D. James	D. James.
	Varteg Hill:				
169	Gas Coal Slope	Pontypool	Ditto	J. Vipond & Co.	John Nixon.
170	New Slope	Ditto	Ditto	Ditto	Ditto.
171	Spotted Pin Slope	Ditto	Ditto	Ditto	Ditto.
172	Three-quarter Level	Ditto	Ditto	Ditto	Ditto.
	Varteg Works:				
173	Black Pin Level	Ditto	Ditto	Partridge, Jones, & Co.	Rees Emmanuel.
174	Black Vein Level	Ditto	Ditto	Ditto	Ditto.
175	Black Vein Slope	Ditto	Ditto	Ditto	Ditto.
176	Coal Pit	Ditto	Ditto	Ditto	Ditto.
177	Cwmersychan	Ditto	Ditto	Ditto	Ditto.
178	Cwmfrwd	Ditto	Ditto	Ditto	Ditto.
179	Golynos Slope	Ditto	Ditto	Ditto	Ditto.
180	Mine Pit	Ditto	Ditto	Ditto	Ditto.
181	No. 10 Level	Ditto	Ditto	Ditto	Ditto.
182	Plascoed	Ditto	Ditto	Ditto	Ditto.
	Victoria:				
183	No. 1 Pit	Ebbw Vale	Ditto	Ebbw Vale Steel & Iron Co.	Evan Parry.
184	No. 5 „	Ditto	Ditto	Ditto	Ditto.
185	No. 16 Level	Ditto	Ditto	Ditto	Ditto.
186	No. 17 Pit	Ditto	Ditto	Ditto	Ditto.
187	Wain Level	Nantyglo	Ditto	Morgan Morgans	M. Morgans
188	Wain Llwyd	Ebbw Vale	Ditto	Ebbw Vale Steel & Iron Co.	R. Jordan.
189	Waterloo	Blackwood	Ditto	Davies and Morgan	T. Davies.
190	White Rose	New Tredegar	Ditto	Powell's Duffryn Co.	J. Butson.
191	Winches	Nantyglo	Ditto	J. Lewis	J. Lewis.
192	Yard Level	Ditto	Ditto	J. Chilton	J. Davies.

List under the Coal Mines Regulation Act—*continued.*

No.	Name of Mine.	Situation of Mine.		Name of Owner.	Name of Manager.
		Post Town.	County.		
193	Clydach	Brynmawr	Breconshire	Lewis and Morgan	W. Morris.
194	Hendre	Ditto	Ditto	Jacobs and Co.	C. Probart.
195	No. 1 Level	Beaufort	Ditto	A. Jones	A. Jones.
196	Ryttw	Brynmawr	Ditto	Morgan and Williams	T. Watkins.
197	Wainavon Slope	Ditto	Ditto	Phillips and Williams	J. Phillips.
198	Yard Level	Beaufort	Ditto	A. Jones	A. Jones.
199	Brain's Level	Hengoed	Glamorgan-shire.	James and Williams	— James.
200	Brithdir	Merthyr Tydvil	Ditto	Dowlais Iron Co.	T. Bevan.
201	Cefn Clwyna	Pontypridd	Ditto	W. and E. Beddoe	E. Beddoe.
202	Cil haul	Bargoed	Ditto	Bargoed Coal Co.	J. Jeremiah.
203	Energlyn	Caerphilly	Ditto	Euerglyn Coal Co.	H. F. Lewis.
204	Gilfach Vargoed	Maesycwmmer	Ditto	Price and Evans	W. Evans.
205	Glanravon	Ditto	Ditto	Price, Brothers	T. Ellis.
206	Gwladis	Pengarn	Ditto	W. and E. Beddoe	E. Beddoe.
207	Hendredenny	Cardiff	Ditto	David and Sloper	W. Cosslett.
208	Hengoed	Maesycwmmer	Ditto	J. Jones	J. Jones.
209	Hengoed	Ditto	Ditto	Thos. Thomas	T. Thomas.
210	Llantwit and Black Vein	Caerphilly	Ditto	Llantwit and Black Vein Co.	H. Begg.
211	New Rhos	Pengarn	Ditto	E. D. Williams	J. Howells.
212	Old Rhos	Bargoed	Ditto	W. and E. Beddoe	E. Beddoe.
213	Penwaingoch	Blackwood	Ditto	E. D. Williams	J. Price.
214	Rhôs Llantwit	Caerphilly	Ditto	Rhôs Llantwit Coal Co.	J. Richards.
	Rhymney:				
215	Cefn Brithdir	Rhymney	Ditto	Rhymney Iron Co.	D. Abraham.
216	Darran	Ditto	Ditto	Ditto	Ditto.
217	Pidwallt	Ditto	Ditto	Ditto	Ditto.
218	Terrace	Ditto	Ditto	Ditto	Ditto.
219	Duffryn	Ditto	Ditto	Ditto	Ditto.
220	Twyn Carno	Ditto	Ditto	Ditto	Ditto.
221	Rudry	Caerphilly	Ditto	Nicholas and Johnson	A. Johnson.
222	Twyn-y-coedcae Rudry	Machen	Ditto	Marland and Davies	J. Lewis.
223	Wingfield	Pengarn	Ditto	Wingfield Colliery Co.	T. Ellis.
224	Addis Hill	Cinderford	Forest of Dean.	H. Crawshay and Son	(Not working.)
226	Aimwell	Yorkley	Ditto	James James	J. James.
226	All Profit	Cinderford	Ditto	J. A. Brain	J. Brain.
227	Aries Level	Lydbrook	Ditto	T. Watson	T. Watson.
228	Bailey Hill	Yorkley	Ditto	J. Protheroe	J. Protheroe.
229	Bixlade	Coleford	Ditto	J. T. Thomas & Co.	J. T. Thomas.
230	Bridewell	Ditto	Ditto	W. Prichard	W. Prichard.
231	Broomingholt	Ditto	Ditto	H. J. Brown	J. Brown.
232	Buckholt	Ditto	Ditto	J. T. Thomas	T. Garwood.
233	Chapel Quarry	Ditto	Ditto	J. Doward	J. Doward.
234	Cross Knave	Ditto	Ditto	Ben. Davies	B. Davies.
235	Crumpmeadow	Cinderford	Ditto	Bilson and Crumpmeadow Co.	A. Thomas.
236	Dark Hill	Coleford	Ditto	E. L. Waddington	E. L. Waddington.
237	Dog Delf	Yorkley	Ditto	H. Phipps	J. Phipps.
238	Duck Pit	Newnham	Ditto	Messrs. Gould	A. Thomas.
239	East Slade	Cinderford	Ditto	New Bowson Co.	J. Burdess.
240	Edenwall	Coleford	Ditto	Shad. Hughes	S. Hughes.
241	Ellwood	Ditto	Ditto	Ellwood Green Colliery Co.	T. Miles.
242	Farmer's Folly	Ditto	Ditto	Farmer's Folly Co.	J. Willis.
243	Farmy Lay	Ditto	Ditto	Shad. Hughes	S. Hughes.
244	Findall	Cinderford	Ditto	Gollop and Ridler	(Not working.)
245	Flour Mill	Lydney	Ditto	J. Goulton	Ditto.
246	Foxes Bridge	Cinderford	Ditto	Foxes Bridge Colliery Co.	A. Thomas.
247	Gentlemen Colliers' Colliery	Coleford	Ditto	J. Smith	J. Smith.
248	Great Western	Cinderford	Ditto	Great Western Coal Co.	S. Jones.
249	Harry Hill Prosper	Drybrook	Ditto	J. Roberts	J. Roberts.
250	Hawkins' Coleford	Coleford	Ditto	J. Morris	J. Morris.
251	Hawkwell	Cinderford	Ditto	J. Chivers	T. Smith.
252	Haywood	Ditto	Ditto	Littledean Woodside Coal Co.	Ditto.
253	Highmeadow	Coleford	Ditto	High Meadow Coal Co.	T. Willis.
254	Hopewell Engine	Mitcheldean	Ditto	G. Oldland	J. W. Blanch.
255	Howbeach	Ditto	Ditto	Gollop and Ridler	Ditto.
256	Howlerslade	—	Ditto	Trotter, Thomas, & Co.	J. T. Thomas.
257	Inkerman	Cinderford	Ditto	George Russell	F. Nichol.
258	Invention	Drybrook	Ditto	J. Mathews & Co.	J. Mathews.
259	Knockley Tump	Bream	Ditto	S. Jenkins	S. Jenkins.
260	Leather Pit	Cinderford	Ditto	J. A. Russel	J. A. Brain.
261	Lightmoor	Ditto	Ditto	H. Crawshay and Son	T. Smith.
262	Little Brittain	Yorkley	Ditto	J. Phipps	J. Phipps.

LIST under the COAL MINES REGULATION ACT—*continued.*

No.	Name of Mine.	Situation of Mine.		Name of Owner.	Name of Manager.
		Post Town.	County.		
263	Morse's Level	Blakeney	Forest of Dean.	W. Edwards and Son	W. Edwards.
264	Nag's Head	Yorkley	Ditto	Hough and Atkinson	G. H. Hough.
265	New Birch Hill Folly	Coleford	Ditto	Reuben Joynes	R. Joynes.
266	New Bridge Engine	Nailbridge	Ditto	Mitcheldean Coal Co.	J. Williams.
267	New Engine	Parkend	Ditto	Forest Coal Mining Co.	—
268	New Fancy	Ditto	Ditto	Parkend Coal Co.	A. Thomas.
269	New Found Out	Coleford	Ditto	Shad. Hughes	S. Hughes.
270	New Road Level	Ditto	Ditto	Holmes & Co.	J. Aston.
271	Oaken Level	-	Ditto	-	(Not working.)
272	Old Croft	Yorkley	Ditto	Hough and Atkinson	J. H. Hough.
273	Old Fire Engine	Cinderford	Ditto	S. Baldwin	S. Baldwin.
274	Old Furnace	Coleford	Ditto	Trotter, Thomas, & Co.	J. T. Thomas.
275	Paragon	Cinderford	Ditto	P. Constance	(Not working.)
276	Parkend	Lydney	Ditto	Parkend Coal & Iron Ore Co.	S. Jones.
277	Park Hill	Ditto	Ditto	Ditto ditto	(Not working.)
278	Phipps' Pillowell	Ditto	Ditto	Phipps and Price	J. Phipps.
279	Pillowell Level	Ditto	Ditto	Lückes and Nash	(Not working.)
280	Pluckpenny	Cinderford	Ditto	J. A. Brain	J. A. Brain.
281	Princess Royal	Bream	Ditto	Capt. W. W. Ross	(Not working.)
282	Prosper	Lydbrook	Ditto	G. Russel	T. Trigg.
283	Quidchurch	Cinderford	Ditto	J. Crook & Co.	J. Crook.
284	Regulator	Drybrook	Ditto	J. A. Brain	J. A. Brain.
285	Resolution and Safeguard	Cinderford	Ditto	H. Crawshay and Son	(Not working.)
286	Ruardean Hill	Blakeney	Ditto	S. Holmes	S. Holmes.
287	Speedwell	Lydbrook	Ditto	G. Russel	G. Thomas.
288	St. Vincent	Ditto	Ditto	Wanklin and Grindall	J. Grindall.
289	Success	Coleford	Ditto	J. T. Thomas	J. T. Thomas.
290	Thatch	Lydbrook	Ditto	Oliver Lewis	D. Pogson.
291	Till Quarry	Coleford	Ditto	Ellwood Green Colliery Co.	T. Deakin.
292	Trafalgar	Drybrook	Ditto	J. B. and W. B. Brain	J. Brain.
293	Uncertainty	Bream	Ditto	G. Williams	G. Williams.
294	Union and Cannop Engine	Cinderford	Ditto	Union and Cannop Engine Colliery Co.	W. Needham.
295	Villets Level	Coleford	Ditto	Trotter, Thomas, & Co.	J. T. Thomas.
296	Wallsend	Cinderford	Ditto	Gollop and Ridler	A. Ridler.
297	Waterloo	Ditto	Ditto	J. A. Brain	J. A. Brain.
298	Wimberry	Coleford	Ditto	Trotter, Thomas, & Co.	J. T. Thomas.
299	Woodgate	Ditto	Ditto	H. F. Hale	H. F. Hale.
300	Worrell Hill	Lydbrook	Ditto	R. Thomas	W. Harris.
301	Belgium Pit	Bristol	Gloucestershire.	Kingswood Coal & Iron Co.	M. Johnson.
302	California	Ditto	Ditto	A. and G. Fussel	E. Gay.
303	Coal Pit Heath	Ditto	Ditto	Sir H. G. Smith	J. Naysmith.
304	Crew's Hole	Ditto	Ditto	H. C. Burge	H. C. Burge.
305	Crew's Hole	Ditto	Ditto	Johnson and Andrews	— Johnson.
306	Crown	Warmley	Ditto	— Goldney	T. Garthwait.
307	Easton	Bristol	Ditto	Leonard, Boult, and Co.	E. W. B. Monks.
308	Fishponds	Ditto	Ditto	W. Flower	W. Flower.
309	Golden Valley	Ditto	Ditto	Aaron Brain	A. Brain
310	Hanham	Ditto	Ditto	Hanham Coal Co.	W. B. Monks.
311	Kingswood	Ditto	Ditto	Kingswood Coal & Iron Co.	M. Johnson.
312	Mangotsfield	Ditto	Ditto	Brown and Butler	G. Brown.
313	Mangotsfield Common	Ditto	Ditto	S. Phipps	S. Phipps.
314	New Cheltenham	Ditto	Ditto	Chubb and Waring	(Not working.)
315	Newent	Gloucester	Ditto	Newent Colliery Co.	W. F. Clark.
316	Old Land	Bristol	Ditto	Fussel & Co.	H. Gay.
317	Parkfield	Ditto	Ditto	Wethered and Cossham	J. Sherborne.
318	Pennywell Road	Ditto	Ditto	Pennywell Coal Co.	T. Brown.
319	Rangeworthy	Ditto	Ditto	E. J. Owen	E. J. Owen.
320	Shortwood	Ditto	Ditto	C. Lovel	C. Lovel.
321	Siston Hill	Warmley	Ditto	S. H. Hadleigh	H. Gay.
322	Speedwell	Bristol	Ditto	Kingswood Coal and Iron Co.	M. Johnson.
323	Whitehall	Ditto	Ditto	Leonard, Boult, & Co.	W. B. Monks.
324	Yate	Ditto	Ditto	Long, Howell, & Co.	E. W. B. Monks.
325	Ashton Vale	Ditto	Somersetshire	Ashton Vale Iron Co.	M. Cowcill.
326	Bishop Sutton	Ditto	Ditto	Bishop Sutton Coal Co.	J. Cook.
327	Braysdown	Braysdown	Ditto	G. W. Doubeny & Co.	W. Steart.
328	Buckland Dinham	Frome	Ditto	James Oxley	D. Thomas.
329	Camerton, New	Bath	Ditto	Miss Jarrett	G. Feare.
330	Camerton, Old	Ditto	Ditto	Ditto	Ditto.
331	Clandown	Radstock	Ditto	C. Hollwey	M. Shearn.
332	Conegre, Lower	Bath	Ditto	Samborn, Smith, & Co.	J. Selway.

List under the Coal Mines Regulation Act—*continued.*

No.	Name of Mine.	Situation of Mine.		Name of Owner.	Name of Manager.
		Post Town.	County.		
333	Conegre, Upper	Bath	Somersetshire	Samborn, Smith, & Co.	J. Selway.
334	Dean Lane	Bristol	Ditto	H. Bennet	H. Bennet.
335	Downside	Bath	Ditto	W. Evans	W. Evans.
336	Edford	Stratton	Ditto	Edford Colliery Co.	M. G. Morgan.
337	Farringdon	Bristol	Ditto	Farringdon Coal Co.	M. Shearn.
338	Foxcote	Radstock	Ditto	Foxcote Colliery Co.	J. Wilkins.
339	Frysbottom	Clutton	Ditto	Clutton Coal Co.	G. Maggs.
340	Grayfield	Ditto	Ditto	Ditto	Ditto.
341	Huish	Radstock	Ditto	Writhlington Colliery Co.	J. Wilkins.
342	Kelmersdon	Ditto	Ditto	Kelmersdon Colliery Co.	Ditto.
343	Mackintosh	Coleford	Ditto	Westbury Iron Co.	J. Batey.
344	Malago Vale	Bristol	Ditto	Bristol Colliery Co.	R. Hope.
345	Newbury	Coleford	Ditto	Westbury Iron Co.	J. Batey.
346	New Rock	Bath	Ditto	New Rock Coal Co.	J. Cook.
347	Old Mills	Bristol	Ditto	W. Evans	W. Evans.
348	Old Welton	Radstock	Ditto	Old Welton Colliery Co.	M. Shearn.
	Radstock :—				
349	Ludlows	Ditto	Ditto	Countess Waldegrave	Jas. McMurtrie.
350	Middle Pit	Ditto	Ditto	Ditto	Ditto.
351	Tyning	Ditto	Ditto	Ditto	Ditto.
352	Wellsway	Ditto	Ditto	Ditto	Ditto.
353	South Liberty	Bristol	Ditto	Ashton Vale Iron Co.	M. Cowcill.
354	Temple Cloud	Ditto	Ditto	H. C. Hippisley	H. C. Hippisley.
355	Welton Hill	Midsomer Norton	Ditto	C. Hollwey	C. Hollwey.
356	Westend	Bristol	Ditto	Nailsea Coal and Coke Co.	G. James.
357	White Oak	Ditto	Ditto	White Oak Colliery Co.	W. Morgan.
358	Writhlington, Lower	Radstock	Ditto	Writhlington Colliery Co.	J. Wilkins.
359	Writhlington, Upper	Ditto	Ditto	Ditto	Ditto.
360	Bideford	Bideford	Devonshire	Bideford Black Paint Co.	T. Pollard.

Mr. T. F. Evans' Report.

Report upon the Inspection of Metalliferous Mines in the Counties of Anglesey, Brecon, Cardigan, Carnarvon, Denbigh, Flint, Merioneth, Montgomery, Radnor, Shropshire, and the Isle of Man, for the Year 1878.—By Thomas Fanning Evans, Esq.

Sir, Amlwch, Anglesey, 24th March 1879.

I have the honour to make a report of my proceedings during the year 1878, as required by section 20 of "The Metalliferous Mines Regulation Act, 1872."

The mines included in my district are scattered over the counties and islands named above, and number 244, showing an addition of 10 to last year's list. It is, however, necessary to explain that no returns have been received from 20 small mines, which, to my knowledge, were working until recently, and that 15 others are reported as suspended or in liquidation.

As the statute, unfortunately, does not require a notice of abandonment of mines in which not more than 12 men are ordinarily employed below ground, the whole or a portion of the 15 from which I have received no returns may also have been suspended; but as this is a matter on which I can only be enlightened by a personal visit to the mines in question, I am at present unable to say how far the agents have neglected that section of the Act which demands the sending in of a return on or before the 1st February in each year from every mine, whatever may be the number of persons employed.

I have thought it well to keep the names of all these mines upon my list, in the view of the possibility that the working of those suspended and those in liquidation may shortly be resumed, and that some of those from which I have received no returns may also be found to be working, or only temporarily suspended.

On the 1st January of this year I sent to every mine a circular in which the requirements of the Act as regards the Return were pointed out to the owner or agent, and along with it the official Form of Return, and a copy of the Abstract of the Acts, a Welsh copy of the Abstract being added in the case of every mine situated in the Welsh-speaking portions of my district. This was followed up by a circular, dated the 1st February, addressed to all those mines from which the first circular elicited no Returns, which pointed out the liability to prosecution for the neglect, but in spite of this caution I have received neither the 20 Returns in default, nor an explanation of the cause of their non-appearance.

It will be my business to ascertain to what extent there has been a contravention of the statute in this respect, and to report to you upon the matter.

This Report includes the usual statistics, tables, and lists; namely,

1. A list of the fatal accidents in the district;
2. A list of the non-fatal accidents;
3. A list of the mines, showing the number of persons employed in each, classified according to their ages and employment, and stating the quantity and kind of mineral produced;
4. General summaries of the persons employed and the minerals produced during the year; and
5. A list giving the name and address of every mine-owner working a mine, the situation of the mine, and the name of the resident agent, superintendent, or barmaster who signs the statutory return.

FATAL ACCIDENTS.

The fatal accidents during the year come under the following heads :—

Falls of Ground.		
Falls of side - - - - -	0	
,, ,, roof - - - - -	1	
	1 causing	1 death.
In Shafts.		
Falling part way down - - - -	1 causing	1 death.
Miscellaneous Underground.		
Explosions of gunpowder and other explosives -	7 causing	8 deaths.
By trams - - - - -	1 causing	1 death.
On Surface.		
By machinery - - - - -	2 causing	2 deaths.
Making a total of	12 accidents and	13 deaths.

The list is as follows :—

MINES CLASSED UNDER THE METALLIFEROUS MINES REGULATION ACT.

LIST of the FATAL ACCIDENTS, and LOSS of LIFE arising therefrom, in Mr. T. F. EVANS' DISTRICT, comprising Anglesey, Cardiganshire, Carnarvonshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Radnorshire, Shropshire, and the Isle of Man, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
Jan. 5	1	Dyffryn Aled	Denbighshire	Dyffryn Aled Lead Mining Co.	Joseph Roberts	Miner	21	Falling down an underground shaft in the mine. He was supposed to have attempted to seize the rope employed in drawing stuff while it was in motion, and to have missed it	–	–	1	–	–
„ 14	2	Welsh Slate	Merionethshire	Welsh Slate Co.	David Jones	Slate Miner	59	This case was first reported as a non-fatal accident on the 2nd January. The man was at work underground, and, with others working near him, was warned that a blast was going to be fired. The others got away in ample time, but he being very lame was left a little behind, and a stone from the blast came and hit him on the head	–	–	–	1	–
Feb. 6	3	Cwmorthin	Merionethshire	Cwmorthin Slate Co.	Hugh Ellis	Slate Miner	22	The deceased, having charged four holes for blasting, and fired three, went down by a chain to fire the fourth. While he was thus engaged the chain broke, and dropped him to the bottom, where he was found dead	–	–	–	1	–
„ 13	4	Snailbeach	Shropshire	Snailbeach Mining Co.	James Evans	Miner	39	The explosion of a charge of powder while the deceased was stemming it with an iron stemmer tipped with copper	–	–	–	1	–
„ 23	5	Van	Montgomeryshire	Van Mining Co. (Limited).	Benjamin Jones	Labourer	16	No one was near when this accident occurred, and the manner in which it happened is only a matter of surmise	–	–	–	–	1
April 10	6	Halkyn Deep Level.	Flintshire	Halkyn Deep Level Co.	W. M. Thornton	Mechanical Engineer.	45	Suffocation in the fumes produced by the firing of several charges of guncotton	–	–	–	1	–

LIST OF FATAL ACCIDENTS—*continued.*

Date.	No. of Accidents.	Name of the Mine or Colliery.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous Underground.	Above Ground.
1878.													
May 14	7	Baldwin Mine -	Isle of Man -	Manx Silver Lead Mineral Co., Limited.	John Cannell -	Miner -	36	These men were killed by the explosion of a charge of dynamite, which was supposed to have hung fire - - - - - -	–	–	–	2	–
					William Corlett	Miner -	35						
May 18	8	Braich Goch -	Merionethshire -	Braich Goch Slate Co.	Edward Evans	Slate Miner	55	He was injured on the 2nd instant by a stone which fell upon him from the roof of his working place, and died from the effects of the injury on the 8th	–	1	–	–	–
July 13	9	Palmerston -	Merionethshire -	The Welsh Slate Co.	John Davies -	Labourer	24	Died from injuries received on the 12th inst. through being thrown by a tram from a "quay" in the mine.	–	–	–	1	–
Sept. 10	10	Votty and Bowydd.	Merionethshire -	Votty and Bowydd Slate Co.	Griffith Roberts	Labourer	50	Crushed between the trunk of a water balance and the top of an aperture through which it had to pass	–	–	–	–	1
Oct. 21	11	Oakeley, Upper	Merionethshire -	The Rhiwbryfdir Slate Co.	Humphrey Davies.	Slate Miner	27	Died from injuries received from the explosion of a charge of powder, to which he returned after firing it, under the impression that it had gone off -	–	–	–	1	–
Dec. 21	12	Talargoch -	Flintshire -	Talargoch Mining Co.	Evan Williams	Miner -	39	The explosion of a charge of dynamite - -	–	–	–	1	–
									–	1	1	9	2

In addition to the remarks made against each fatality thus recorded, the following notes made at the coroners' inquests, and on making inquiries into the attendant circumstances, may possibly prove useful in explaining the causes which led to the casualties.

Falls of Ground.

I have only one fatal accident, No. 8 on my list, to class under this head; and as it so happened that I was in the Isle of Man when it occurred, and could not return in time to attend the inquest, I have but to lay before you the particulars, courteously supplied me by the Coroner, from the depositions made on the occasion.

A man employed in the same mine said:—"I knew the deceased. I work at Braich Goch "quarry (*mine*). Deceased worked there also. He was injured at that quarry on the "1st May instant. A stone fell on him. I was at the bottom of the *bongc* (a Welsh quarry-"man's term for the stope in which he works). No one was working above us at that time. "I worked close by the deceased. We had both been working above the bottom bongc. "The stone came from the roof. No blast had been fired for a fortnight at the place where "the stone fell from. I saw the deceased examining the place two or three days before the "accident. He was struck on the back."

The surgeon called in to him deposed that the deceased was so seriously injured in the back, as well as in some internal organs, that he died from exhaustion on the following Saturday the 8th instant.

The Coroner having explained that he had given the Inspector of Mines the notice required by the Act, and that they had the power of adjourning for his attendance if they considered it advisable, the jury replied that the accident was one of so simple a nature that they did not consider any further inquiry necessary, and returned a verdict in accordance with the evidence.

In Shafts.

Accident No. 7 in the list occurred in the Dyffryn Aled Lead Mine in Denbighshire, in a shaft sunk from an underground level. The deceased was assisting in repairing some portions of the pit-work, and had occasion to go to the top to fetch some tools required in the work, and when returning with the tools upon his shoulder he jumped at the winding rope then going down, in order to save himself the labour of descending by the ladders. He missed the rope, and falling a distance of 50 yards met with instant death. It was proved very clearly at the inquest that the managing agent of the mine had repeatedly cautioned his men not to come down by the rope when the cage provided for the purpose was not attached, and had on several occasions reproved the deceased for his rashness in that and other practices. An examination of the spot made by me the second day after the accident, while everything remained unaltered, and a very searching inquest subsequently held, failed to establish any other conclusion than that the young man himself was solely to blame for the unfortunate accident which caused his death.

Miscellaneous Underground.

Accident No. 2 was first reported on the 2nd January as one which had caused serious personal injury, but the poor fellow only lingered on painfully until he died, on the 14th. It was suggested at the inquest that being lame the deceased had not sufficient time to retire to a place of safety between the notice of the intended firing and the explosion of the charge; but as it was proved that the other men working near had more than ample time for that purpose, it may be presumed that he became a victim to the rash carelessness which is unfortunately too common among men whose vocation renders them so familiar with the use of dangerous explosives.

In the case of Accident No. 3, which appears in this class, it should be explained that it was only indirectly caused by the explosion of a charge of blasting-powder. The man had charged four holes, and, in order to fire them, had to descend a considerable distance to the middle of the "chamber" in which he worked by means of a chain fastened at the top of his working place. He went down, and fired three holes successively, and when descending in the same manner to fire the fourth a quantity of stuff, in which there was one stone of great size, came down, and with it the deceased, with about eight yards of the chain by which

he had been supported. His fellow workman, who was in a place of shelter about 26 yards from the spot, shouted out, asking him the cause of the unusual noise, and receiving no reply went immediately to the spot. He found him dead, with the piece of chain lying by his side. The witness stated as his opinion that the stuff which fell had been loosened by a former shot, and that the large stone it contained had broken the chain, thus causing the fatal fall. I examined the chain when I visited the mine on the following day, and had come to the same conclusion before it was stated at the inquest. The jury, among whom were several retired slate miners, returned a verdict that the deceased met with his death accidentally, and that the chain was broken by a cause which no human foresight could have prevented.

Accident No. 4 occurred at the Snailbeach Mine, in the county of Salop. The inquiry as to the cause was, with your permission, attended to by Mr. Inspector Martin on my behalf.

At the inquest, the witness (himself slightly injured by the explosion) stated that it occurred while the deceased was stemming the hole with an iron stemmer tipped with copper. He could not say how far the deceased had proceeded with his stemming when the explosion took place, but stated that he considered him careful always to put paper and a "fodder" of dry grass on the powder. Mr. Martin came to the conclusion that they were not sufficiently careful in selecting the stuff for stemming, and that the accident was due to that neglect, combined with the iron tamping-bar.

Accident No. 7 is the most serious which appears in my list. It occurred on the 14th May, in the Baldwin Mine, in the Isle of Man, and caused the death of two miners. I visited the scene of the occurrence as soon as possible, but the appearance of the place conveyed no information as to the cause of the accident, or the immediate attendant circumstances.

Mr. Harris, the High Bailiff of Douglas, opened the inquest, the proceedings of which were reported as follows, in the *Manx Sun* :—

Terrible Accident at the Ohio Silver Lead Mine.—Two Miners killed.

On Tuesday morning information reached Douglas that a terrible explosion of dynamite had taken place at the Manx Silver Lead Mine, better known as the Ohio Mine, East Baldwin, and that two miners had been blown to atoms. It appears that the night shift men had fired two blasts in the bottom of the shaft, which is in course of being sunk to a greater depth, and that one only had gone off, and they left the ground for the men who succeeded them on the next shift, as they could not tell whether the fuse had missed or not, and it would be dangerous to go to work again before allowing sufficient time to elapse to make it certain that the fuse was either spent or gone out. They gave notice of this to the manager, and the shift of men who succeeded them. These were John Cannell and William Corlett, and it would appear that when they had descended the shaft they proceeded to "draw" the charge of the hole, which had not gone off. How far they succeeded in this operation will never be known, and whether they used the ordinary precautions required in so delicate an operation will equally remain a secret. It is thought that in drawing the charge they must have struck the detonating cap with some iron implement, and thus caused the explosion. From the fact that both the unfortunate men had their breast bones driven in, it would seem that they must have been stooping over the hole at the time the charge went off. The catastrophe has cast a gloom over the whole neighbourhood, and much sympathy is expressed for the families of the unfortunate men, who bore excellent characters.

His Worship the Coroner of Inquests for this district (S. Harris, Esq.,) held a preliminary inquest at the mine the same day touching the sad occurrence, informing the jury that he should simply take a little formal evidence that day, and then adjourn to another day to allow time for communicating with Mr. Evans, Her Majesty's Inspector for this district under the Metalliferous Mines Regulation Act. The following evidence was then taken :—

John Crowe deposed :—I am the local agent of the Manx Silver Lead Mining Company, the owners of the mine formerly known as the Ohio Mine, in East Baldwin. I have looked at the bodies of the deceased John Cannell and William Corlett, now lying in the workshop or shed belonging to the said Mining Company. The were taken out of the shaft to-day. John Cannell was one of the miners employed in the said mine. He lived at Mount Rule in Braddan. He was a married man, about 30 years of age, an experienced miner, and a sober man. He went to his work as usual this morning down the shaft of the mine, and his dead body was brought up from the shaft this afternoon about two o'clock. He met with his death from an explosion of dynamite in the mine about eight o'clock this morning. The other body is the body of William Corlett, of East Baldwin. He also was a miner, and about 32 years of age. He also was married, and was an experienced miner. His dead body was brought out of the mine about the same time as Corlett's, and he met with his death at the same time and from the same cause.

Dr. Elliott, who was next examined, said :—I have examined the body of William Corlett, now lying in the workshop adjoining, and find a compound fracture of the lower part of the thigh of the left leg, which was almost blown off. The breast bone is almost blown in over the heart, and depressed upon the heart. I did not find any other fractures on his body, but his face is covered as if

with powder, and he was killed apparently from a heavy stone having been thrown on his breast from an explosion in the shaft of the mine. He must have been killed instantaneously, and has the appearance as if death had taken place this morning: there is warmth even now in the lower part of his body. I have also made an examination of the body of John Cannell. There is a dislocation and fracture of the right hip and thigh; the breast bone is beaten in and fractured. His head is almost blown off, his brains completely blown out, and the body has all the appearance of having been killed instantaneously from an explosion of dynamite in the mine. His death must have been instantaneous, and as if it had occurred this morning from the effects of an explosion of dynamite.

His Worship the Coroner then informed the jury that no further evidence would be taken that day, as, under the provisions of the Metalliferous Mines Regulation Act, notice must be sent to Mr. Evans, the Government Inspector under that Act for this district, who would most probably be required to attend the inquest. He would therefore adjourn the inquest to Tuesday, the 21st inst.

We understand that his Worship wrote to Mr. Evans the same day, and the Inspector has since intimated his intention of attending the inquest.

At the adjournment—

John Crowe, sworn, said:—I am local agent to the Manx Mineral Company, and have to see that everything is carried on in a proper manner, and that the men do their work in a satisfactory way. The mine has been carried on about three years by the present Company, and has been worked about 11 years altogether. I was brought up a miner, and have worked in many mines in the Isle of Man and in England, and have had considerable experience as a practical miner. We have 12 men now working underground. They work three shifts. The deceased men, John Cannell and William Corlett, were two of the men employed as miners here. They had worked here since the beginning of last harvest time. They were good miners, steady and industrious—very. On the night of the 13th, James Thompson, John Gelling, Thomas Quaine, and William Callow were the night shift at the mine. They went to work at 10 o'clock, and left work a little before 6 a.m. on the 14th. We give out the dynamite daily; sometimes two boxes; a sufficient supply for the day of dynamite fuse and caps. On the day of the 13th the ordinary quantity was given out. It was from 10 to 15 lbs. of dynamite. It is made up in small cartridges, consisting of six to the pound weight. They come ready made up by the manufacturers. The men use dynamite according to the burden the charge is required to move. I have not had any previous experience in the use of dynamite. We have had it in use here for about five months. Directions how to use it come with every 5 lbs. package. They are given to the workmen using it. There is a shaft in the mine with levels running north and south. The shaft is about 80 fathoms deep, and the men are engaged sinking on the bottom, when they have to carry on blasting operations. The rock is rather hard, and dynamite has to be used for blasting it. It consists of a hard spar and clay-slate. I have been down since the accident took place. The place was then covered with water. I know from my own former observations what the place is like. The accident occurred at the bottom of the shaft. When the night shift came up as I have described, they were followed on the morning of the 14th by Jno. Cannell and William Corlett, the two deceased men. That was all that went down that morning. After they went down they began to fill the stuff into the kibbles, and send it to the surface. They had sent up seven kibbles, but when the eighth was being drawn up it stuck in the shaft for a while, and was afterwards found to be empty. This showed there was something wrong with the men at the bottom of the shaft. I came here just at that time. One of their own mates, who was at the top at the time, went down the shaft to see what was the matter. He returned, and told us he believed that all was over at the bottom, there being no light, and he could hear no sound. I sent four men to see what was the matter. They came up shortly, and told me that the men were lying quite dead at the bottom of the shaft. The bodies were brought up the shaft, and placed in Company's shed, where the jury saw them. The tools used are drills, hammers, and picks. We never used iron, copper, or steel stemmers. We have only proper swab sticks for ramming the charge in the holes, and, so far as I know, we have strictly conformed and complied with the printed rules and regulations laid down for the use of dynamite. I have known blasts to hang fire about an hour and a half. That is the longest I have known. It was about seven o'clock in the morning when the seventh kibble came up. We use the best double tape fuse, which we buy with the dynamite. The fuse is kept in a perfectly dry place. The men use their own judgment as to the quantity of fuse they take. We never restrict the men in any matter of the kind. They are supplied with materials at their own discretion. My opinion is that the accident occurred through one of the charges not having gone off when fired, and that it exploded while one of the deceased men was steadying the kibble, and the other standing by preparing to fill.

James Thompson, miner, sworn, said:—On the 13th I was one of the men engaged on the night shift. We went down at 10 o'clock, taking nothing but candles with us. We had previously sent the dynamite down in the kibbles. There were about eight or nine charges in the kibble. We shortly began to bore preparatory to blasting. We had one hole 3 ft. 6 in. deep. It was in blue rock mixed with spar. Our companions were at work boring another hole 3 ft. deep. These borings were going on near each other, about 4 ft. apart. We then drew water from the shaft, and, having done this, bored two more holes. The water was swabbed out of the holes, and the charges put in. There were six cartridges put into each hole; I think so. I did not put them in. Each hole was charged. They were put down with a wooden rammer. Water was used as a stemming. I put the fuse into a cap, and the cap into a primer, according to the printed instructions. The fuse was three feet long in each hole. This fuse was sufficient; and the match also takes time to burn, so that we have time enough to reach a place of safety. I saw the fuse of the hole that killed the men running. We heard only three holes going off. My mate went down afterwards to ascertain what was amiss. He

went down in about five minutes. It was John Gelland who went down. I met Cannell and Corlett (the deceased men) in the changing house. I told them about these holes, and that we thought that one of them had missed fire, but that we could not tell with certainty, owing to its being covered with stuff from the other holes. They then went down. John Gelling charged all the holes.

John Gelling, miner, sworn, said:—I was Thompson's mate on the night in question. I am a miner, and have worked underground about seven years. I charged all the holes. Thompson put in the fuse, and the four were lighted at the same time. The detonators were put into primers in each hole. We went up to the 70 fathom level lodge. I looked down the shaft, and saw that three of the fuses had taken fire, but I could not see the one at the south end. We could not see that one on account of the timber we were standing on. The bottom of the shaft was slightly sumped in the middle. We heard three charges going off. We waited about ten minutes. I went down to see how things were, and saw that three holes had gone off. The fourth was covered over with stones from the other blasts.

Robert Cullon, miner, sworn, said:—The débris was left by order of the coroner until the place was inspected by Mr. Evans, the Inspector of Mines. Yesterday evening I went down the shaft, and found the loose stuff lying in it, just the same as when the dead men were found. I am most certainly of opinion that the last explosion (the fatal one) took place from the hole under the chain ladder. Both men were quite dead when I went down about 9 o'clock. No stuff was lying on them, except a very little on Corlett's legs.

Henry Taggart, blacksmith, sworn, said:—I heard the conversation between Thompson and Gelling and the dead men. They told them the hole had missed.

The jury returned a verdict that the deaths were purely accidental.

It was, in my opinion, the result of the explosion of nitro-glycerine which had exuded from the unexploded charge of dynamite, caused by a blow from one of the tools used by the men.

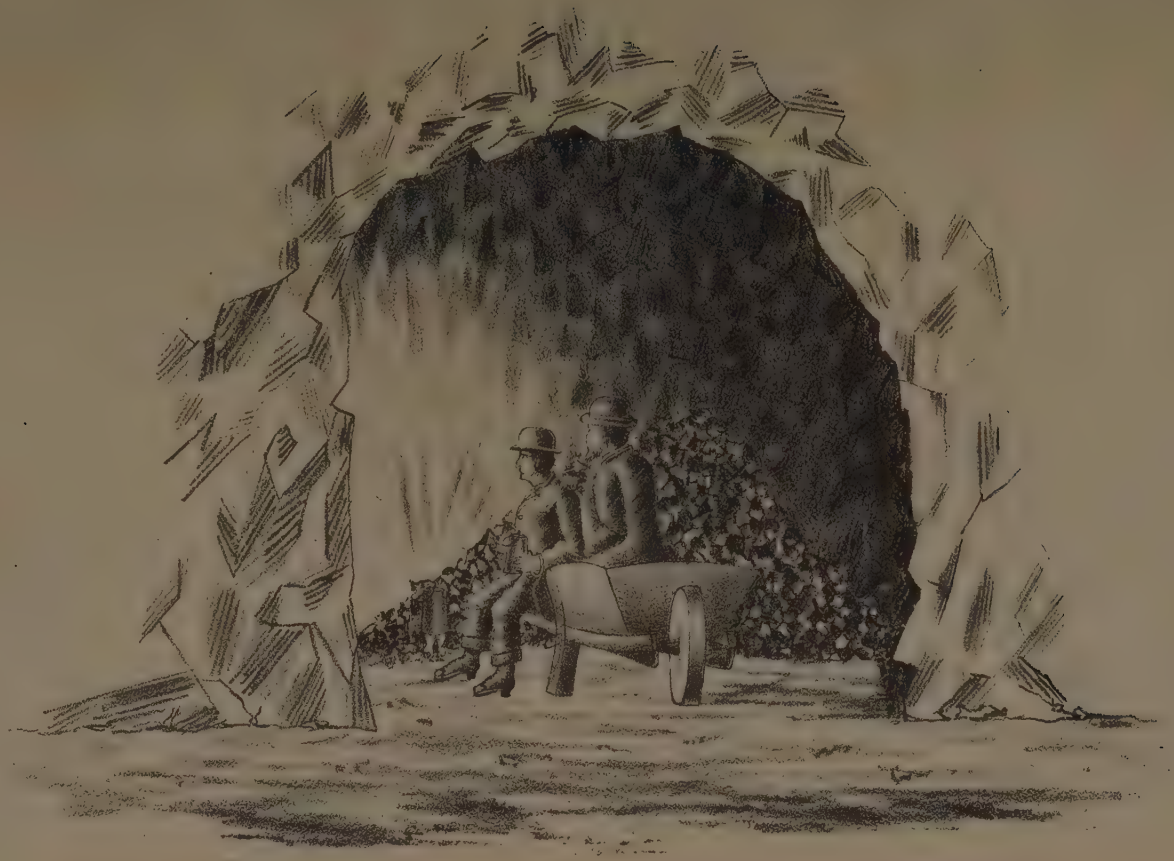
Accident No. 11, the next in this class, occurred at the Oakeley Upper Quarries (a slate mine) on the 15th October. It was first reported to me as a non-fatal accident caused by the explosion of a charge of blasting powder, but the sufferer died on the 21st from the effects of the injuries he had received.

The deceased man was working alone at the time; but another workman, employed near him, gave evidence that on hearing a noise as if of a blasting charge when he did not expect to hear any such report, he ran to the spot, and found him much injured about the eyes. The injured man told him he was using only a very small quantity of powder. Before this the deceased had charged a hole 5 inches deep, and had fired it in the usual manner. Both men retired after the firing, and waited some time for the charge to go off, but hearing no report the deceased told him that the powder must have gone off through a rent which ran across the hole, and thus accounted for a slight noise which they had heard. He then returned to his working place, taking with him a small sledge, with which, he said, he intended to beat away the piece of rock. Very soon after this the explosion took place.

The witness was of opinion that the charge had not gone off as supposed, and that it was fired by the hammering of the sledge. This is very likely, as the ground—itself a soft slate rock—contained a good of iron pyrites.

The next accident in this class, No. 12, and the last on my list, occurred at the mine of The Talargoch Mining Company, Flintshire, on the 21st December. The inquest in this case was attended by Major Ford, as Inspector under the Explosives Act, and myself. The circumstances were very simple, and revealed a highly reprehensible rashness on the part of the unfortunate victim. He and his son, a youth of 15, had bored a hole, and were preparing to charge it with dynamite. The boy cleared out the hole while the father got the charge ready. The latter, finding that the dynamite required thawing, proposed that while he did this by putting the stuff into a tin over a candle they should eat some bread and butter which they had brought down with them. They sat down on a barrow for this purpose, and while they were thus engaged the dynamite exploded with great violence. The accompanying sketch, made in order to explain the accident to the jury, shows how rashly the poor man acted.

The father was hurled with fatal force against the side of the level, and the boy was thrown a considerable distance, but received no other bodily injury than a severe shaking, except that a deafness, from which he previously suffered, was increased by the shock sustained. The boy, who was the only witness, said that his father had used dynamite for two years, and had always prepared it for charging the holes. On being shown the directions for using dynamite issued with every box, and printed in English, Welsh, and Gaelic, the witness said he had never seen them, or heard them read or explained. The agent, on being called, stated that he had no idea that any such practice as the thawing of dynamite in the manner described existed in the mines under his charge, and that every provision was made for performing that operation in the proper way. The scene of the accident was left untouched until I visited the spot. The



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Dangerfield. Lith. 22. Bedford St. Covent Garden.

pieces of bread and butter the men were eating lay on the ground where they were sitting at the time of the explosion, and a part of a pound of candles hung close to the charge bore hardly any marks of its force. The wheelbarrow too was uninjured.

Suffocation by Gases.

Accident No. 6, which, in my opinion, comes under this head, occurred at the Halkyn Deep Level, an adit driven for the purpose of draining an extensive mineral tract in the county of Flint. The circumstances attending this casualty led many to regard it as being of an unaccountable and mysterious nature; but, as it was one out of several of the same kind which have come within my experience, it appeared to me to be very simple and easy of explanation. The superintendents of the driving operations were engaged upon some experiments undertaken for the purpose of testing the value of guncotton as compared with dynamite as a blasting agent. Four charges of guncotton inserted in holes in the fore-breast of the level were first fired; after this four charges of dynamite were similarly fired; this was followed by two successive firings of guncotton, making altogether sixteen charges of the two explosives. In their anxiety to see the result of the last firing, the party, consisting of four agents and eight miners, went up to the end of the level while the air, vitiated, no doubt, by the former discharges, was rendered still more poisonous by the last firing. They were all affected by the gases evolved by the explosions; but Mr. Thornton, being a stout and heavy man, succumbed to their effects, while the others saved themselves by retiring. The guncotton agent, an experienced old miner, who was present and superintended the charging and firing of the shots, begged of them not to enter the end too soon; but they disregarded precautions which, if heeded, would most certainly have averted this unfortunate event. As much has been said and written upon this affair with an evident tendency to attribute the casualty to the character of the explosive chiefly used, I cannot allow the opportunity of expressing my opinion to pass by without stating that the same result would probably have happened if the party had gone to the end with equal haste after the explosion of the same quantity of any other explosive.

To hint to the contrary may cause great mischief by leading mine agents and men to suppose that some explosives vitiate the air so slightly that a man may with impunity return to a close end immediately after a discharge. So much have I for some time been impressed with the danger of this practice that I made it a particular subject of remark and suggestion when last year, at your request, I reported specially to you upon a matter indirectly connected with the mines of my district.

The jury found, "That Mr. W. M. Thornton died accidentally through suffocation by the "fumes of guncotton; and we recommend that in future more than five minutes should be "allowed before going to the face after the firing of charges of guncotton."

By Trams and Tubs.

The only accident coming under this head is No. 9, which occurred at the Palmerston Slate Mine on the 13th July, on which day it was reported to me as an accident which had caused serious bodily injury. The man died on the following day. The circumstances were as follows:—There is an incline from which slate is drawn up from the mine by means of a steam-engine. Two of the four lines of rail forming this incline extend to the lower part of the mine, while the other pair form a curve and enter into a shallower level, thus making a small precipice between the two lines of rail where they separate. This was then partly fenced by a bulwark of stones, occasionally used by the men as a resting place on which to sit while waiting for their trucks. The deceased on the day named was standing between a truck and this edge, where there was a space of about a yard and a half, and leaning against a large stone with which the truck was loaded, when another truck came down the incline, and struck the loaded one with so much force as to upset it, throwing the man over the side of the precipice described. The descending truck contained three men who were returning to their work after dinner, but they felt nothing from the shock of the collision. According to the evidence given, there appeared to be some carelessness on the part of the engineman at the top in not attending properly to the break when letting down the trucks; but it was also very evident that the poor man who was killed was very thoughtless in remaining where he was when he saw the descending waggon approaching so rapidly. The jury returned a verdict that he came by his death by accident, but recommended that more care should in the future be taken in sending waggons up and down inclines.

On Surface.

By Machinery.

Accident No. 5 occurred at the Van Mine on the 23rd February. In this case there was no evidence to show exactly how the casualty occurred. It was supposed, apparently with good reason, that the lad took a scraper to scrape some stuff from under the elevator wheel of the dressing machinery, and that the scraper having got fast in the wheel he was dragged in with it. In this case also I was compelled to ask your permission to allow Mr. Inspector Martin to attend the inquiry in my behalf, and I have to acknowledge that gentleman's ready and able assistance.

Accident No. 10, which occurred on the 10th September at the Votty and Bowydd Slate Mine, comes under this class. It was of a somewhat singular nature. Slate and slabs are drawn up an incline from one floor of the works to another by means of a water balance, the trunk of which passes close under a bridge along which a tram-car passes. While the deceased and another man were working the water balance on that day, it was part of the duty of the deceased to let the water out of the trunk when it reached the bottom;—an operation performed by means of a valve at the bottom of the trunk, which, being connected with a lever at the top, was readily opened with a forked rod passing through the bridge. The arrangement appears usually to have worked well, but on this occasion it happened that the breaksman at the top being a new hand, some irregularity occurred which caused the trunk to stop before quite reaching the bottom, thus failing to bring the lever within reach of the rod by which it should have been opened. Some confusion now occurred. The breaksman at the top left his break in order to try to get the trunk to the bottom by shaking the rope while the deceased mounted the trunk for the purpose of opening the valve by pressing on the lever with his hand. This at once caused the trunk to ascend; and the deceased, having no means of going down soon enough, was caught between it and the bridge, and so much crushed that he died very soon after being taken to the hospital. The accident was the result of a stupid blunder, to which both men contributed, the deceased perhaps more largely than his comrade.

Non-fatal Accidents.

MINES CLASSED UNDER THE METALLIFEROUS MINES REGULATION ACT.

List of Non-fatal Accidents in and about the Metalliferous Mines of Mr. T. F. Evans' District during the Year 1878.

Date.	Number of Accidents.	Names of Mines and Situations.	Falls of Ground.			In Shafts.		Miscellaneous Underground.					On Surface.			Gross Total.	Remarks.
			Falls of Side.	Falls of Roof.	Total Falls of Ground.	Falling from part way down.	Total in Shafts.	Explosions of Gunpowder, &c.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total Miscellaneous Underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																	
Jan. 2	1	Palmerston, Merionethshire	–	1	1	–	–	–	–	–	–	–	–	–	–	1	Skull fractured by a stone fro blast. Died 14th January.
„ 15	2	Great Laxey, Isle of Man -	1	–	1	–	–	–	–	–	–	–	–	–	–	1	A man severely cut in the hea the fall of a "slipe" of gro from the side.
„ 22	3	New Rhosydd, Merioneth-shire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	Falling from one floor to anot below.
„ 23	4	Cwmorthin, Merionethshire	–	1	1	–	–	–	–	–	–	–	–	–	–	1	Fall of ground, causing a se flesh wound.
„ 24	5	Braichgoch, Merionethshire	–	–	–	–	–	–	–	–	1	1	–	–	–	1	Falling from a ladder undergro
Feb. 4	6	Frongoch (Lisburne), Cardi-ganshire.	–	1	1	–	–	–	–	–	–	–	–	–	–	1	Some stuff fell from above, h ing a man badly.
„ 8	7	Votty and Bowydd, Merio-nethshire.	–	–	–	–	–	–	–	1	–	1	–	–	–	1	A man seriously injured by be squeezed between a waggon the side of the level.
„ 13	8	Llanrwmbach, Cardigan-shire.	–	–	–	–	–	2	–	–	–	2	–	–	–	2	Two men injured by explosion an old hole which they w unramming.
„ „	9	Snailbeach, Shropshire -	–	–	–	–	–	1	–	–	–	1	–	–	–	1	One man killed and another inj by the explosion of a ch which they were ramming.

List of Non-Fatal Accidents—*continued.*

tc.	Number of Accidents.	Names of Mines and Situations.	Falls of Ground.			In Shafts.		Miscellaneous Underground.					On Surface.			Gross Total.	Remarks.
			Falls of Side.	Falls of Roof.	Total Falls of Ground.	Falling from part way down.	Total in Shafts.	Explosions of Gunpowder, &c.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total Miscellaneous Underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
78. 22	10	Cwmorthin, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	Explosion of gunpowder through the bursting of a cartridge which the man injured was forcing into a hole just above his own candle. Injury slight.
28	11	Aberystwyth, Cardiganshire	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A boy had his fingers crushed in a portion of the dressing machinery.
7	12	Cwmorthin, Merionethshire	1	–	1	–	–	–	–	–	–	–	–	–	–	1	A young man had his foot so much injured by a fall of stone upon it that it had to be amputated.
9	13	Maenofferen, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A man had charged a hole first with a ball of dynamite, upon which he placed a charge of ordinary powder. On returning he found that the blast had not done its work satisfactorily, and thereupon set to work to drill the hole again. Upon this the dynamite exploded, and injured him severely.
„	14	Braich Goch, Merionethshire	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A workman slightly injured while putting a block on one of the slate-sawing machines.
11	15	Van, Montgomeryshire	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A slight injury to the arm from the fall of a stone upon it.
14	16	Braich Goch, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A man injured by the explosion of a charge which had missed fire while he was unramming it.
15	17	Abercwmeiddaw, Merionethshire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A serious injury received by a fall from his working-place, caused by neglecting to use a chain which had been placed there for the special purpose of supporting him.
„	18	Aberllefenny, Merionethshire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	He and his partner were loading a waggon with rubbish, when his partner accidentally struck him in the temple with a stone which he was lifting.
„	19	Welsh Slate Co., Merionethshire.	–	–	–	–	–	1	–	–	–	1	–	–	–	1	The explosion of a charge while a man was ramming it. The second time of charging the hole.
18	20	Lisburne, Cardiganshire	–	–	–	–	–	–	–	–	–	–	–	1	1	1	A youth had a fall of about 8 feet through the giving way of a plank on which he was standing.
25	21	Welsh Slate, Merionethshire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A man fell from one floor to another, a distance of 15 yards, on the 8th Jan., but the agent did not at the time consider it serious enough to require reporting to the Inspector.
26	22	Great Laxey, Isle of Man	–	–	–	–	–	1	–	–	–	1	–	–	–	1	Serious injury by the explosion of a charge of powder while the man was inserting his copper pricker preparatory to stemming.
1 6	23	Diphwys Casson, Merionethshire.	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A boy was caught by a strap and drawn round the pulley, causing a fracture of the leg.
9	24	Llechwedd, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A man's ribs fractured by a stone from a blasting charge.
8	25	Oakeley, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	Slight injury through the explosion of a charge which he was unramming.

List of Non-Fatal Accidents—*continued.*

Date.	Number of Accidents.	Names of Mines and Situations.	Falls of Ground.			In Shafts.		Miscellaneous Underground.					On Surface.			Gross Total.	Remarks.
			Falls of Side.	Falls of Roof.	Total Falls of Ground.	Falling from part way down.	Total in Shafts.	Explosions of Gunpowder, &c.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total Miscellaneous Underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																	
April 20	26	Talargoch, Flintshire	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A boy had his thigh fractur through getting entangled in t shafting that drives the crus ing mill.
„ 24	27	Oakeley Middle, Merioneth-shire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	Falling in his working-place.
„ 25	28	Esgair Mwyn, Cardigan-shire.	–	–	–	1	1	–	–	–	–	–	–	–	–	1	Falling a short distance from ladder, thereby injuring h ankle.
May 1	29	Braich Goch, Merionethshire	1	–	1	–	–	–	–	–	–	–	–	–	–	1	The falling upon a man of a sto from a block of slate which was taking down.
„ „	30	New Rhosydd, Merioneth-shire.	–	–	–	–	–	–	–	–	–	–	–	1	1	1	A waggon-load of rubbish w tipped on a man's leg, causi serious injury.
„ 3	31	Park Slate, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	Unramming a charge of powd that had missed fire.
„ 9	32	Oakeley, Merionethshire	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A man injured while riding truck on an incline.
„ 7	33	Drym, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A man severely injured wh blasting. The charge explod before he could get away. could not explain the cause. is supposed to have left loo powder about; and the h having been very loosely tampe it is supposed that this fired t charge before the fuse reached
„ 8	34	Oakeley, Merionethshire	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A man fell from one chamber another.
„ 11	35	Wrysgaen, Merionethshire	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A boy of 14 had a fall which caus severe injuries to his forehea
„ 14	36	Wrysgaen, Merionethshire	–	–	–	–	–	–	–	–	–	–	–	1	1	1	A man was making a tramwa when some of the materials was using fell upon him a broke his leg.
„ 15	37	Cwmorthin, Merionethshire	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A man had his foot crushed tween two blocks of stone.
„ „	38	Cwmorthin, Merionethshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	Injury received through the plosion of a charge of powd "while ramming the third part the stemming on the wadding
„ 17	39	South Darren, Cardigan-shire.	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A boy got his arm so much injur in some of the dressing machine that it had to be amputated.
„ 22	40	Snailbeach, Shropshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	An explosion of a charge of powd while ramming the first part the tamping with a copp tamping rod.
„ „	41	Oakeley Middle, Merioneth-shire.	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A small piece of rock came dow from the roof, and hit a man the small of the back.
„ 23	42	Conglog, Merionethshire	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A man had the small bone of leg broken through his slippi down from his *bargain* along *slant*.
June 5	43	Van, Montgomeryshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	Two men injured by the explosi of a charge which they we unramming.
„ „	44	Oakeley Middle, Merioneth-shire.	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A piece of rock came down fr the roof of a chamber, and i jured a man severely in the har
„ „	45	Minera, Denbighshire	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A stone from the roof came dow and caused a compound fractu of a man's leg while he w working below.
„ 6	45	Oakeley Upper, Merioneth-shire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A man fell while walking on a tra way, and was slightly injured
„ 12	46	New Rhosydd, Merioneth-shire.	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A man named William Robe was injured through his a getting into the machinery was working—a sawing table
„ 17	47	Votty and Bowydd, Merionethshire.	1	–	1	–	–	–	–	–	–	–	–	–	–	1	A man injured by the fall of a sto upon him in his working-pla
„ 25	48	Gorsedd and Merllyn, Flint-shire.	–	–	–	–	–	2	–	–	–	2	–	–	–	2	Two men injured while tampi blasting charges.
July 9	49	Votty and Bowydd, Merionethshire.	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A man slightly hurt through foot slipping while he was o water balance.

List of Non-Fatal Accidents—*continued.*

&c.	Number of Accidents.	Names of Mines and Situations.	Falls of Ground.			In Shafts.		Miscellaneous Underground.					On Surface.			Gross Total.	Remarks.
			Falls of Side.	Falls of Roof.	Total Falls of Ground.	Falling from part way down.	Total in Shafts.	Explosions of Gunpowder, &c.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total Miscellaneous Underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
'8. 11	50	Tanybwlch, Carnarvonshire	–	1	1	–	–	–	–	–	–	–	–	–	–	1	The pitman was examining the roof of a level when some stuff suddenly came down upon him and injured his foot.
„	51	Lisburne, Cardiganshire	–	–	–	1	1	–	–	–	–	–	–	–	–	1	A man was repairing the shaft when a stone fell from overhead, and caused him a severe flesh wound in the leg.
„	52	Palmerston, Merionethshire	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A man was thrown over a "quay" 15 feet down, by a waggon coming against him. Died next day.
15	53	Minera, Denbighshire	–	–	–	–	–	–	–	–	1	1	–	–	–	1	An engineman fell from a stage on which he was at work, and received a wound upon the head.
16	54	Oakeley Middle, Merionethshire.	–	–	–	–	–	–	1	–	–	1	–	–	–	1	A man received an injury to the head through placing it between two tram waggons while they were in motion.
20	55	Lisburne, Cardiganshire	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A man received a severe cut in the head from a stone which fell from above.
27	56	Drum, Merionethshire	1	–	1	–	–	–	–	–	–	–	–	–	–	1	A labourer was cutting through some slate rock and "marl" when a quantity of the latter fell upon him and caused severe injuries.
29	57	Rhiwbryfdir, Merionethshire.	–	–	–	–	–	–	–	–	–	–	–	1	1	1	Robert Williams, labourer, fell a distance of 10 or 12 yards.
8	59	Oakeley Middle, Merionethshire.	–	–	–	–	–	–	–	1	–	1	–	–	–	1	One Hugh Williams had the bridge of his nose broken by the handle of a crane which he was working.
7	60	Assheton, Carnarvonshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A man slightly injured by an explosion of gunpowder.
31	61	Mona, Anglesey	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A slight injury from a small stone from the roof.
3	62	Oakeley Upper, Merionethshire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	The falling of a stage on which a man was working. It was his duty to see that it was properly secured.
4	63	Oakeley Middle, Merionethshire.	–	–	–	–	–	–	–	–	–	1	–	–	–	1	A loaded waggon turned over and fell on a man, causing him injury, but not of a severe nature.
20	64	Oakeley Middle, Merionethshire.	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A man named William Ellis was climbing to his working-place, holding two cartridges of powder in his mouth. One burst, and was fired by his candle, on which the second also exploded. He was rather seriously burnt.
19	65	Palmerston, Merionethshire	–	–	–	–	–	–	–	1	–	1	–	–	–	1	One Daniel Morgan was seriously bruised by the capsizing of a waggon upon him.
20	66	Palmerston, Merionethshire	1	–	1	–	–	–	–	–	–	–	–	–	–	1	A piece of rock fell from the side, and rather seriously injured a man named John Edwards.
23	67	New Rhosydd, Merionethshire.	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A man injured through his coat getting fast in a sawing-table.
28	68	Oakeley Upper, Merionethshire.	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A lad named J. D. Jones fell on one of the saw-tables, and had his arm seriously injured by the saw.
4	69	Palmerston, Merionethshire	–	–	–	–	–	–	–	–	–	–	1	–	1	1	One Price Price had his leg fractured by falling under the lifting machine on one of the inclines.
9	70	Diphwys Casson, Merionethshire.	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A workman struck between the shoulders by a stone from the roof. Injury not very serious.
„	71	New Rhosydd, Merionethshire.	–	–	–	–	–	–	–	–	–	–	–	1	1	1	A man fell into an open working while turning the course of a stream of water.
15	72	Oakeley Upper, Merionethshire.	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A man named Humphrey Davies (27) had fired a blasting charge, and was removing the loose pieces detached by the blast, when another explosion occurred. It was supposed that his crowbar struck a spark, which ignited an unexploded portion of his original charge.

List of Non-Fatal Accidents—*continued.*

Date.	Number of Accidents.	Names of Mines and Situations.	Falls of Ground.			In Shafts.		Miscellaneous Underground.					On Surface.			Gross Total.	Remarks.
			Falls of Side.	Falls of Roof.	Total Falls of Ground.	Falling from part way down.	Total in Shafts.	Explosions of Gunpowder, &c.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total Miscellaneous Underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878. Oct. 17	73	Minera, near Wrexham	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A man named Edward Edwards h his leg broken by a fall of sto and timber upon it.
21	74	Tanybwlch, near Pwllheli	1	–	1	–	–	–	–	–	–	–	–	–	–	1	One Griffith Jones (21) had his th broken by a piece of rock wh fell upon him from the hang side of the vein.
„ 28	75	New Rhosydd, Merionethshire.	–	–	–	–	–	–	–	–	–	–	1	–	1	1	A man named William Edwards h his head injured through putti it under a slate-dressing machi
Nov. 1	76	New Rhosydd, Merionethshire.	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A man named Edward Jones slightly injured by a piece rock which fell from the r and struck him on the head.
„ 7	77	Llechwedd, Merionethshire	–	–	–	–	–	–	–	–	–	–	2	–	2	2	Two men were injured while p paring to lift up a water-wh frame.
Dec. 7	78	Oakeley Middle, Merionethshire.	–	–	–	–	–	1	–	–	–	1	–	–	–	1	One Owen Jones (25) met w injury, not supposed to be serio by the explosion of some pow with which he was about to charge a hole which had failed do its intended work at the f firing.
„ „	79	Great Dylife, Montgomeryshire.	–	–	–	–	–	–	–	–	1	1	–	–	–	1	A man named Thomas Jervis, ag 42, fell about 15 yards throu the breaking of a rope to wh he unnecessarily trusted weight, and in the fall caused fracture of the ankle.
„ 10	80	Votty and Bowydd, Merionethshire.	–	–	–	–	–	–	–	1	–	1	–	–	–	1	A man named Robert Roberts injured by being squeezed tween a waggon which had the rails and the side of the sh
„ 11	81	Oakeley Upper, Merionethshire.	–	1	1	–	–	–	–	–	–	–	–	–	–	1	David Richards (36), slate mi slightly injured in the he arms, and leg by the falling piece of rock from above, wh he was engaged in loosening
„ 13	82	Cwmorthin, Merionethshire	–	1	1	–	–	–	–	–	–	–	–	–	–	1	A man injured by a scale of r falling from the roof upon legs.
„ 21	83	Talargoch, Flintshire	–	–	–	–	–	1	–	–	–	1	–	–	–	1	A youth of 17, named David W liams, injured by the explosio a quantity of dynamite which father had put in a tin abov candle to soften. The father killed by the same explosio
			7	15	22	2	2	22	1	4	15	42	15	5	20	86	

Comparing the non-fatal accidents of the last three years, they appear thus :—

	1876.	1877.	1878.
Falls of ground	13	18	22
In shafts	—	5	2
Explosions of powder, &c.	13	20	22
Sundries	9	14	20
On surface	5	5	20
	40	62	86

Showing yearly a considerable increase in the number of accidents coming under this head. As a simple statement of these figures, without any explanatory observations, would greatly mislead, it becomes necessary to remark that the increase has arisen to a great extent from my having latterly encouraged mine owners and mine agents to send me reports of almost every accident, whether coming under the words "serious personal injury" of the Act, or not; and, to a smaller extent, from the better understanding of that

portion of the statute which provides that any accident from "explosion of gas, powder, or steam-boiler," however trivial the personal injury may be, has to be reported to the inspector of mines. The desire generally evinced among mine agents to observe faithfully the requirements of the Acts, and the readiness as a rule displayed to comply with every wish I have expressed even conversationally, have contributed to the large figures now obtained. These extended statistics are valuable, inasmuch as they furnish data which the fatal accidents of my district, owing to their paucity, fail to supply in the same degree. The amount of injury sustained is adventitious. The causes of accident, as proved by these statistics, recur with singular regularity, and in proportions which vary but slightly from year to year. The non-fatal accidents are therefore deserving of careful examination, and anything which can be done to lessen the probability of their future occurrence becomes a matter of important consideration, especially as a man who survives an injury is often able to supply information as to the cause of accident, which cannot be obtained in a fatal case. A comparison of the causes and practices which led to them will be found, on reference to the summary of fatal accidents, to be the same as those which led to those more serious casualties; and, adverting more particularly to the accidents by explosions of blasting agents, it is shown that 22 out of 86, rather more than one-fourth of the non-fatal accidents, come under this class, while 8 out of 13 deaths are referrible to the same cause. Analysing these accidents according to the particulars supplied to me in the course of inquiries made, I find that of the deaths thus caused 2 appear to have been the result of pure misadventure, while 5 occurred through the rashness of the sufferers, their ignorance of the dangers incidental to the use of the explosives employed, or to want of due attention to the instructions and cautions which should have been observed. Of the 22 non-fatal accidents appearing in this column, 6 occurred through contravention of General Rule 2 of the Act, 7 were of a doubtful nature, while 9 were clearly the result of gross thoughtlessness on the part of the injured men. Most of those recorded as doubtful would probably have come under one of the other two categories had all the facts and circumstances been obtainable. It is much to be deplored that so high a per-centage of deaths and injuries should be directly attributable to the carelessness of men who are the subject of so much protective legislation; and I can sympathise with mine agents who tell me that it is almost discouraging to find that their cautions and injunctions, given with the view of lessening the danger to their men, are so habitually disregarded. But, in the hopes that the information thus acquired might be usefully applied, I issued the following circular to every mine in my district:—

Sir, Amlwch, Anglesea, 10th April 1878.

Several accidents having recently occurred in my district through the neglect by workmen of those portions of General Rule 2 which says,—

(*d.*) "In charging holes for blasting * * * * an iron or steel tamping rod or stemmer shall "not be used for ramming either the wadding or the first part of the tamping or stemming "on the powder;" and

(*e.*) "A charge of powder which has missed fire shall not be unrammed;"

I deem it advisable to call your special attention to these rules, and to beg that you do all in your power to enforce their observance in the mines under your charge, by impressing upon the miners in your employ the importance, for the sake of their own safety, of a strict compliance with the provisions of the statute.

Two men were recently severely injured at the Llanrcwmbach Mine, in Cardiganshire, by the explosion of a charge which they were unramming, while another received a serious injury from the same cause at the Braich Goch Slate Mine, Corris. I have received instructions from the Secretary of State to reprove these men severely, and to convey his pardon in consideration of the mutilations they have suffered, but I am to inform you that the lenity with which they are treated will not be extended to future instances of a similar violation of the Act.

I am, Sir, your obedient servant,

(Signed) T. F. Evans.

The Owner or Agent

_____ *Mine.*

I have been much pleased to find that many of the mine agents have read this notice to their men, and that they still continue to remind them of the caution it contains. The men whom you pardoned for contravention of the rule have given me their promise never to offend against the Act again, and have assured me that they will tell all other miners of the personal and legal risks incurred by the practices through which they have themselves suffered. There is, therefore, reason to hope that these accidents will abate in number as the frequency of their occurrence becomes more generally known. A solitary casualty occurring in a remote mine is speedily forgotten, and publicity is seldom given to accidents which do not prove fatal; but when miners and mine agents are continually reminded of the importance of observing this portion of the statute, and have the dangers of non-compliance brought

frequently under their notice, there is every reason to believe that accidents of this nature will decrease considerably.

The same remarks apply to the accidents caused by falls of ground; but it affords me pleasure to add that I have latterly observed that much more care is taken than formerly to lessen this danger. The number of non-fatal accidents from this cause is comparatively large, but the remarks made against each prove a large proportion to be of a trivial nature, while others appear to have been the result of want of due care on the part of the men themselves.

Prosecutions.

I have found it necessary to prosecute for contravention of the Act in the following cases:—

1. Against two miners at the Van Mine, for unramming a charge of powder. They were brought before the magistrates at Llanidloes, and fined 2*s*. 6*d*. each, and costs.

2. Against the agent of the Assheton and West Assheton Mines, in the county of Carnarvon, for two separate offences. He made no defence, and was fined 5*l*. and costs for not having a plan of the mine, and 5*l*. and costs for not providing sufficient accommodation for the drying and changing of the men's clothes.

3. Against a miner, employed at the Assheton Mine, for unramming a charge of powder which had missed fire. He admitted the offence, and was fined 1*s*. and costs, on my telling the Bench that I wished merely to make an example of him, and that the slightest penalty they could inflict would answer that purpose, especially as the poor man had received a more severe punishment in the shape of a serious injury to the face.

4. Against Mr. Edward Jones, the owner of the Pant-y-Buarth Mine, near Mold. In this case I took out two summonses against Mr. Jones; one for not casing off the portion of a shaft used for the ascent and descent of persons from the portion used for raising the mineral raised as required by General Rule 9, and the other for not posting the abstract. The Bench inflicted a penalty of 10*s*. and costs for the first-named offence; and in the case of the second, asked me to withdraw the charge on receiving the defendant's promise to be careful to observe all the requirements of the Act in the future. I consented to this the more readily, inasmuch as the defendant had explained that the abstract was posted inside his office, and that he did not know that this was not sufficient.

5. Against the agent of the Llechwedd Slate Mine, in the county of Merioneth, for not keeping a register of the young persons employed in the mine under his charge. He was fined 1*s*. and costs.

It became my duty in the course of the year to report to you other instances of contravention of the Act, but, owing to certain attendant circumstances, you did not consider it advisable to institute legal proceedings.

These prosecutions are by far the most disagreeable part of my duty. It has been most painful to me to have been compelled during last year to prosecute men from whom I have invariably received courtesy and kindness; but finding that the circulars I have so frequently sent to the mines, calling attention to the more important provisions of the Act, failed to secure their due observance, I felt bound to take legal proceedings, in order to prove that no continued neglect of the provisions of the statute could be allowed. An idea has seemed to prevail that an inspector is bound to give special notice of an offence before he takes proceedings against the offender, and to allow time to remedy any deficiency discovered. While the Act was new to those whom it affected, it was but just and fair that such an indulgence should be allowed; but now that the Act has been in operation for more than six years, it cannot surely be regarded as a hardship that the leniency formerly practised should be discontinued. Indeed it would be highly mischievous to allow such a misconception to be perpetuated. Mine owners and mine agents should understand clearly that it is their duty to carry out the provisions of the Act, and that it is the duty of an inspector to discover exceptional departures from the law. In many important mines of my district this view has been taken of the matter, and the consequence is that the greatest safety, consistent with their vocation, is secured for the workmen; the agents take a pride in the paucity of accidents; and my visits become a source of mutual pleasure, arising from the discussion of mining matters and other subjects relating thereto.

Special Rules.

The Special Rules referred to in my last Report as having been proposed to the slate miue owners of my district have now been legally established. As some slight objections were

made to some of them, and trifling alterations agreed to, it is well, perhaps, to give them at length in the form in which they have been finally established. They are thus :—

SPECIAL RULES for the CONDUCT and GUIDANCE of the PERSONS acting in the MANAGEMENT, and of all PERSONS employed in or about the MINE.

Owner and Agent.

45. The owner or agent has the general supervision of the mine under "The Metalliferous Mines Regulation Acts, 1872 and 1875." It is his duty to comply with the requirements of the Acts so far as is reasonably practicable, and to the best of his power to enforce the observance thereof. If the owner or agent does not manage the mine himself, he shall appoint, where, in his judgment, it may be necessary, a manager or mine-captain.

Manager, Mine-Captains, and Foremen.

46. The manager or mine-captain shall appoint such assistant mine-captains or foremen as may be found necessary, and shall inform them what their respective duties are, and shall provide them with the means requisite for their operations. If he is not the owner or agent himself, he shall report, in writing, to his superior if anything be required that is not within the scope of his duty to provide.

The manager, mine-captain, assistant mine-captain, or foreman, each in the work entrusted to him, shall, so far as is reasonably practicable, comply with the requirements of the Acts and of these special rules, and to the best of his power enforce the observance thereof. He shall see—

47. That a copy of the official abstract of the Acts and of these special rules, with the required names and addresses inserted therein (see paragraph 26 in the abstract), be posted up and maintained in a legible state (distinct from any contract rules), where they may be conveniently read by the miners and other work-persons.

48. That the provisions with respect to the employment of women, young persons, and children (8–13) be complied with, and the register thereof (37) kept in the office; also, that no person who works or has charge of an engine, windlass, or gin for winding persons (14) be under 18 years of age, nor any driver of an animal for winding persons be under 12 years of age; also, that (with respect to the limitation of hours) the boys and male young persons between 12 and 16 years of age who work below ground be informed, either verbally or by posted up notice, what time they may enter the mine, and the time before which they shall leave it.

49. That no wages (16) be paid in any public-house or such like place, nor in any place contiguous thereto.

50. That the fencing of abandoned mines (17) be attended to.

51. He shall also observe the general rules (44); and (with a view to safety and discipline) he shall daily examine the working places and travelling roads, and cause every place which he may find dangerous from want of ventilation to be fenced off so that it cannot be inadvertently entered by any person. He shall not allow any old shaft to be entered until a light has been first lowered, nor any large body of gas to be disturbed when it might be turned upon persons.

52. He shall also see that props and other supports are provided and the travelling roads and working places secured by the timber-men or other persons appointed for the purpose.

53. He shall specify the width of the "chambers" or openings in the slate vein, and the width of the pillar between each chamber, and shall see that the proper proportion of pillar be not lessened as the work progresses. Should any pillar show signs of giving way or falling, he shall either withdraw the men or see that sufficient props be set for supporting the ground. He shall see that the roof of each new chamber is left in a safe condition by the "miners" before any slate is allowed to be worked underneath.

54. That the working faces in the chambers are not allowed to approach each other so closely as to cause danger to the workmen by making the floors too narrow.

55. That no stone or loose material be allowed to lie on any pathway, ledge, or landing where it might fall into any chamber or other opening in the mine. That every bridge in the mine be securely fenced, and have a board at the bottom of the fencing to prevent stones falling over the side; also that every dangerous pathway and road in the mine be securely fenced. Also, where it is requisite, a chain shall be provided at each side of the chamber to assist the men in going to and from their working places, and to support them while engaged at work.

56. Any source of danger he may become aware of, or any accident happening, or inability to attend to his duties, or anything being wanted which is not within the scope of his duties to provide, shall be forthwith reported to his superior.

Miners and all other Work-persons.

57. All persons employed in or about the mine shall, so far as is reasonably practicable, comply with the provisions of the Acts and of these special rules, and with such directions with a view to safety and discipline as may be given to them by the manager, mine-captains, or foremen.

58. Each person shall observe the paragraphs 8 to 16, 27, 29, and 44 in the abstract of the Act, so far as they relate to him. And also, with a view to safety and discipline :—

59. He shall, before commencing work and whilst at work, satisfy himself of the safety of any climbing-way, ladder, tub, bucket chain, rope, hook, windlass, crane, or other appliance in his personal use, and shall not use anything that he finds unsafe.

60. He shall, when it is his duty, secure his working-place, and if sufficient props or other supports be not provided, he shall cease work and report the same to the mine-captain or foreman who is in charge.

61. He shall, before commencing work, and every time he returns to it after blasting, make a careful examination, and remove any loose stone or ground that might be dangerous. When firing a shot he shall station himself out of the way, and so as most conveniently to warn other persons of the danger. If a shot miss fire, he shall not return to it (except in case of emergency) during that shift or at soonest until after the lapse of an hour. If the shot goes off, but fails to do its work, he shall not recharge the hole nor put powder into any rent made until after the lapse of 10 minutes.

62. In climbing-ways which are also used for shoots, he shall not cast down any material until he has made himself sure that no person is in the way; and whilst carrying tools or anything up or down any shaft, ladder, or other climbing-way, he shall take care not to let it drop lest any person be below.

63. When working on any incline, brow, or slope, he shall secure his tub or waggon from running away, and before he attempts to take it down he shall ascertain that he has proper scotches or other means for stopping it when required, and when on the way he shall keep behind. Where machinery is used he shall not place a tub or waggon on the plates or rails so that it could run away unless it be hooked or otherwise secured.

64. He must not put anything in the way of the air-current, nor leave open any air-door, or disarrange any appliance for directing the ventilation of the mine. If the air be slack so that candles will not burn freely when placed upright, or if gas of any kind be met with, or if he cut through into any old or suspended working that he does not know to be adequately ventilated, or if he perceive any unusual quantity of water, or anything that may appear unsafe, he shall forthwith report it to the mine-captain or foreman who is in charge.

Name of the Slate Mine, _____

Where situated, _____

Name of the Owner or Company, _____

Name of the Agent, _____

Name and address of the *Inspector* of Mines of the District :—

T. F. Evans, Esq.,
Amlwch,
Anglesey.

Instead of Rule 61, as adopted at the other mines, Mr. Brunton, the engineer to the Maen Offeren Slate Mine at Festiniog, suggested the following as an amendment :—

61. He shall, before commencing work, and every time he returns to it after blasting, make a careful examination, and remove any loose stone or ground that might be dangerous. When firing a shot, he shall station himself out of the way, and so as most conveniently to warn other persons of the danger. If a shot miss fire, he shall not return to it or to its neighbourhood (except in case of emergency) during that shift, or at soonest until after the lapse of half an hour; and when he does return he shall on no account attempt to reopen the old hole, but shall drill another at a distance of not less than four inches from the old hole, and in such a direction that his drill shall not come into communication with the old charge. A breach of this rule is known to be the cause of the majority of the accidents, and the offender will in future be visited with the severest penalties the law allows. If the shot goes off, but fails to do its work, he shall not recharge the hole, nor put powder into any rent made, until after the lapse of 10 minutes.

And the rules are established in this form at the mine under that gentleman's supervision. I have translated both into the Welsh language.

The following rules have also been duly established :—

The Metalliferous Mines Regulation Acts, 1872 *and* 1875,
35 & 36 Vict. c. 77. and 38 & 39 Vict. c. 39.

THE TAN-Y-BWLCH AND BWLCH-Y-TOCYN MINING CO., LIMITED.

SPECIAL RULES.

1. No person shall ride up or down the shafts.

2. No loose materials shall be sent down or up a shaft, unless they are securely placed in a kibble or skip.

3. No person shall leave open any rail or other fence at the opening into a shaft or sump.

4. All persons must satisfy themselves of the safety of their working place, before commencing work, both at the beginning of a shift and after any intermission of working, and whilst at work, and, where timber may be required, must properly secure it.

5. No person shall take down the mine more than four pounds of gunpowder or other explosive or inflammable substance at one time, and it must be in a canister. No person shall unram a charge that has missed fire, nor use an iron or steel pricker, tamping rod, or stemmer, nor shall any person approach any charge or shot, until at least fifteen minutes after such charge has missed fire.

6. All persons underground must give immediate information to the manager or agents of any insecurity of the roof, or other part of the workings, or of the shafts, ladders, and stages, or of unusual quantity of water.

7. No boy under 12 years of age shall work underground.

8. The person or persons appointed by the manager shall frequently examine the ropes, chains, kibbles, and skips, and all their couplings, and shall report any defect in the same to the manager or agents, and, if dangerous to the workmen, shall immediately give notice to the engineman to cease working the same, and shall keep the surface near the mouth of the shaft free from stones and loose materials, and shall put up the fences at the mouth of the shaft when operations have ceased.

9. No person shall go down or into the shaft in a state of intoxication, nor take intoxicating liquor down or into the shaft; and no person shall go down the shafts or into the mine who is not employed therein, unless with the written order of the agent.

10. The engineman shall not exceed the allowed pressure of steam, and shall maintain a proper depth of water in each boiler, and shall at least daily and at every opportunity examine the state of the engine, machinery, and boilers under their care, and all ropes or chains fixed to the drums, skips, or kibbles, and see that they are properly fastened, and that the flanges or horns of the drum project above the outer coil of rope or chain, and, if they find any defect, shall damp the fire immediately, and report it to the manager or agent, and shall not allow any person to enter the engine house, or to work or handle the engines, and on no account whatever shall the engines be left during the time they are in motion.

11. The following signals shall be observed by the banksman and engineman :—

One knock	Stop.
Two knocks	Lower down.
Three knocks	Wind up.

Other signals may be appointed for special occasions.

12. Every person shall obey the direction of the manager or agents under whose control he may be, as to the work required to be done.

13. The wages of each and every person directly employed by the Company shall be paid in the office at the mine situated at Tan-y-bwlch, Abersoch, and every taker shall pay his partners on the mine, and under no pretence whatever at a public-house.

14. Any person who neglects or wilfully violates any of the above "Special Rules" will be liable to the penalties specified in the above Acts.

Name and address of the Owner or Agent.	CAPT. W. H. RICHARDS, Abersoch, near Pwllheli.
Name and Address of the Inspector of Metalliferous Mines of the District.	T. F. EVANS, Esq., Amlwch, Anglesey, N. Wales.

THOMAS FANNING EVANS,
9th July 1878.

Many mine owners have during the year submitted to me so-called Special Rules, which made regulations as to the contracts between them and their men, informing me that the conditions of the Act as to publishing had been duly satisfied. I have, of course, in each instance explained that the Act has nothing to do with the terms of contract between employer and employed, and that Special Rules are established only "to prevent dangerous "accidents, and to provide for the safety and proper discipline of the persons employed in "or about the mine." While some of these rules were posted up on the mines preparatory to sending them to me, I received letters from working miners calling my attention to their contents, and begging my protection against their provisions. The explanations I gave in reply were duly acknowledged.

The following list gives the number of hands employed at each mine, and the quantity and kind of mineral raised :—

MINES CLASSED UNDER THE METALLIFEROUS MINES REGULATION ACT.

NUMBER of PERSONS employed in or about the MINES in MR. T. F. EVANS' District, and QUANTITY of MINERAL raised or sold, in the Year 1878.

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages, 8 to 13. Males.	Females.	Ages, 13 to 18. Males.	Females.	Ages, above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Underground.	Barytes.	Copper Ore.	Iron Ore.	Iron Pyrites. (*Mundic.*)	Lead Ore.	Zinc Ore.	Other Minerals.	Remarks.
ANGLESEY.													Tons.	Tons. cwt.	Tons.	Tons.	Tons. cwt.	Tons. cwt.	Tons. cwt.	
Mona	–	–	44	44	8	10	13	12	16	41	100	144	—	1,022 1	—	—	—	—	Precipitate 302 16 Ochre 1,468 0	
Morfa Du	–	–	9	9	–	–	–	–	–	2	2	11	—	—	—	—	—	—	Blue stone 360 0	
Parys	–	–	13	13	–	–	5	1	1	22	29	42	—	320 2	—	31	—	—	Precipitate 150 15 Ochre 334 5	
	–	–	66	66	8	10	18	13	17	65	131	197	—	1,342 3	—	31	—	—		
CARDIGANSHIRE.																				
Aberystwyth	–	–	6	6	–	–	1	–	2	1	4	10	—	—	—	—	15 0	—	—	
Blaenceulan	–	–	12	12	–	–	–	–	–	4	4	16	—	—	—	—	—	—	—	
Bwlch United	–	–	16	16	–	–	–	–	–	2	2	18	—	—	—	—	—	—	—	
Caenant and Pencraigddu	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—	—	
Cambrian	–	–	27	27	–	–	6	–	1	7	14	41	—	190 0	—	—	20 0	—	—	
Caron	–	–	22	22	–	–	7	–	2	18	27	49	—	—	—	—	30 0	—	—	
Cefn Gwyn	–	–	15	15	–	–	3	1	–	3	7	22	—	—	—	—	21 0	—	—	
Clara Consols	–	–	8	8	–	–	–	–	–	–	–	8	—	—	—	—	—	—	—	
Court Grange	–	–	50	50	–	–	12	–	1	13	26	76	—	—	—	—	36 0	—	—	
Crown	–	–	6	6	–	–	–	–	–	–	–	6	—	—	—	—	—	—	—	
Cwmystwyth	–	8	68	68	–	–	15	20	28	9	72	140	—	—	—	—	372 0	—	—	
De Broke	–	–	25	25	–	–	7	–	3	7	17	42	—	—	—	—	202 0	—	—	
Eagle Brook	–	–	–	–	–	–	–	–	–	8	8	8	—	—	—	—	—	—	—	
East Darren	–	3	56	59	1	–	14	7	8	18	48	107	—	—	—	—	450 0	—	—	
Elgar	–	–	13	13	–	–	–	–	–	–	–	13	—	—	—	—	—	—	—	
Esgair Mwyn	–	–	14	14	–	–	8	1	3	9	21	35	—	—	—	—	76 3	—	—	
Florida	–	–	15	15	–	–	5	–	3	4	12	27	—	—	—	—	22 0	118 0	—	
Frongoch	–	–	65	65	–	–	1	–	–	22	23	88	—	—	—	—	748 13	—	—	
Goginan and Level Newydd	–	2	53	55	–	–	15	12	7	13	47	102	—	—	—	—	314 0	—	—	

Number of Persons employed in or about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages, 8 to 13. Males.	Females.	Ages, 13 to 18. Males.	Females.	Ages, above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Underground.	Barytes.	Copper Ore.	Iron Ore.	Iron Pyrites. (*Mundic.*)	Lead Ore.	Zinc Ore.	Other Minerals.	Remarks.
CARDIGANSHIRE—*cont.*													Tons	Tons. cwt.	Tons.	Tons.	Tons. cwt.	Tons. cwt.	Tons.	
Great Darren	–	–	12	12	–	–	8	2	–	6	16	28	–	–	–	–	60 0	–	–	
Grogwinion	–	2	115	117	1	–	25	3	16	10	55	172	–	–	–	–	1,000 0	–	–	
Lisburne	–	–	125	125	1	–	24	18	30	26	99	224	–	–	–	–	1,095 0	–	–	
Llawrcwmbach	–	–	6	6	–	–	2	–	–	–	2	8	–	–	–	–	7 10	–	–	
Melindwr	–	–	10	10	–	–	–	2	2	2	6	16	–	–	–	–	10 10	–	–	
Monydd Gorddu	–	–	22	22	–	–	10	–	–	14	24	46	–	–	–	–	70 0	–	–	
New Bronfloyd	–	–	46	46	–	–	2	1	2	11	16	62	–	–	–	–	150 0	–	–	
New Tyllwyd	–	–	10	10	–	–	–	–	2	2	4	14	–	–	–	–	7 4	–	–	
Plynlimmon	–	–	31	31	–	–	5	4	5	13	27	58	–	–	–	–	85 0	–	–	
Powell Consolidated	–	–	12	12	–	–	2	4	–	2	8	20	–	–	–	–	120 0	–	–	
Red Rock	–	–	38	38	–	–	2	1	7	9	19	57	–	–	–	–	200 0	–	–	
South Darren	–	–	78	78	–	–	25	4	4	20	53	131	–	116 15	–	–	475 0	–	–	
South Lisburne	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	–	20 0	–	
Talybont	–	–	14	14	–	–	–	–	1	–	1	15	–	–	–	–	5 0	–	–	
Tanrallt	–	–	10	10	–	–	4	–	–	2	6	16	–	–	–	–	23 0	–	–	
Temple	–	–	24	24	–	–	–	–	–	18	18	42	–	–	–	–	–	–	–	
Tynyfron	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	
Vaughan	–	–	29	29	–	–	13	4	1	9	27	56	–	–	–	–	177 0	–	–	
West Esgair Lle	–	–	25	25	–	–	2	–	1	6	9	34	–	–	–	–	–	170 0	–	
West Goginan	–	–	6	6	–	–	–	–	–	2	2	8	–	–	–	–	–	–	–	
Ynys	–	–	9	9	–	–	–	–	–	–	–	9	–	–	–	–	–	–	–	
Ystumtuen	–	–	6	6	–	–	3	–	2	1	6	12	–	–	–	–	54 0	–	–	
	–	15	1,099	1,114	–	–	221	84	131	291	730	1,844	–	306 15	–	–	5,846 0	308 0		
CARNARVONSHIRE.																				
Allwen	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31 5	–	–	
Aberllyn	–	–	10	10	–	–	1	–	–	6	7	17	–	–	–	–	–	–	–	
Assheton	–	–	38	38	5	–	23	–	–	18	46	84	–	14 4	–	–	392 10	84 13	–	
Bettws y Coed	–	–	16	16	–	–	3	–	–	20	23	39	–	–	–	–	33 0	–	–	
Broufadog	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	
Bryneisteddfod	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	2 19	–	–	
Bwlch y Groes	–	–	1	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	
Cae Coch	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	773	–	–	–	
Caegwyn	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	

Number of Persons employed in or about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages, 8 to 13. Males.	Females.	Ages, 13 to 18. Males.	Females.	Ages, above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Underground.	Barytes.	Copper Ore.	Iron Ore.	Iron Pyrites. (*Mundic.*)	Lead Ore.	Zinc Ore.	Other Minerals.	Remarks.
CARNARVONSHIRE—*cont.*													Tons.	Tons. cwt.	Tons.	Tons.	Tons. cwt.	Tons. cwt.	Tons.	
Caerhegle	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	—	—	
Clementina	–	–	10	10	–	–	–	–	–	2	2	12	—	—	—	—	7 0	—	—	
Coedmawr Pool	–	–	12	12	–	–	2	–	–	6	8	20	—	—	—	—	—	—	—	
Daugoch	–	–	9	9	–	–	1	–	–	15	16	25	—	—	—	—	—	—	—	
De Eresby Consols	–	–	8	8	–	–	–	–	–	2	2	10	—	—	—	—	—	—	—	
De Eresby Mountain	–	–	14	14	–	–	1	–	–	3	4	18	—	—	—	—	—	—	—	
Derwen Deg and Pannol Gwyn.	–	–	4	4	–	–	–	–	–	10	10	14	—	3 0	—	—	—	—	—	
Drws y Coed	–	–	15	15	–	–	–	–	–	6	6	21	—	195 0	—	—	—	—	—	
Glyn	–	–	6	6	–	–	–	–	–	–	–	6	—	—	—	—	—	—	—	
Gorlanfarchog	–	–	12	12	–	–	–	–	–	–	–	12	—	—	—	—	8 14	—	—	
Llanrwst	–	2	41	43	–	–	13	–	–	27	40	83	—	—	—	—	341 12	—	—	
North Willoughby	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	—	—	
Pandora	–	–	32	32	–	–	12	–	–	10	22	54	—	—	—	—	136 0	190 0	—	
Port Nigel	–	–	–	–	–	–	–	–	–	8	8	8	—	—	—	—	—	—	—	
Rheuadrwst	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—	—	
Tan y Bwlch	–	–	61	61	1	–	9	6	2	30	48	109	—	595 6	—	—	695 13	40 8	—	
Vale of Conway	–	–	5	5	–	–	–	–	–	–	–	5	—	—	—	—	—	—	—	
West Assheton	–	–	36	36	–	–	–	–	–	12	12	48	—	—	—	—	388 4	105 18	—	
	–	2	344	346	6	–	65	6	2	175	254	600	—	807 10	—	773	3,036 17	420 19		
DENBIGHSHIRE.																				
Bodidris	–	–	18	18	–	–	1	–	–	5	6	24	—	—	—	—	—	—	—	
Bryn Alyn	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	0 15	—	—	
Denbighshire Consolidated	–	–	25	25	–	–	–	–	–	5	5	30	—	—	—	—	39 1	—	—	
Eglwyseg Extension	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—	—	
Minera	–	–	200	200	50	–	69	–	–	110	229	429	—	—	—	—	2,754 0	2,735 0	—	
Minera Mountain	–	–	20	20	2	–	2	–	–	7	11	31	—	—	—	—	38 0	7 0	—	
Pant Du and Waen Lâs	–	–	19	19	–	–	–	–	–	7	7	26	—	—	—	—	40 0	—	—	
Park Lead	–	–	58	58	2	–	4	–	–	7	13	71	—	—	—	—	265 0	242 0	—	
Plas Du and Park	–	–	8	8	–	–	–	–	–	–	–	8	—	—	—	—	—	—	—	
	–	–	356	356	54	–	76	–	–	141	271	627	—	—	—	—	2,136 16	2,984 0		

Number of Persons employed in or about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total	Above Ground. Ages, 8 to 13. Males.	Females.	Ages, 13 to 18. Males.	Females.	Ages, above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Underground.	Barytes.	Copper Ore.	Iron Ore.	Iron Pyrites. (*Mundic.*)	Lead Ore.	Zinc Ore.	Other Minerals.	Remarks.
FLINTSHIRE.													Tons.	Tons.	Tons.	Tons.	Tons. cwt.	Tons. cwt.		
Bryncoch and East Pant y Mwyn Union	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	0 16	–	–	
Celyn Bog	–	–	–	–	–	–	–	–	–	1	1	1	–	–	–	–	–	–	–	
Chwarel Lâs	–	–	6	6	–	–	–	–	–	–	–	6	–	–	–	–	2 19	–	–	
Clwt Militia	–	–	14	14	–	–	–	–	–	2	2	16	–	–	–	–	–	–	–	
Deborah	–	–	4	4	–	–	–	–	–	–	–	4	–	–	–	–	1 8	–	–	
Foel Hiraddug	–	–	6	6	–	–	–	–	–	–	–	6	–	–	–	–	–	–	Tons. cwt.	
Fron Hall United	–	–	30	30	–	–	–	–	–	10	10	40	–	–	–	–	–	–	Cobalt ore 98 18	
Golden Grove	–	–	6	6	–	–	–	–	–	1	1	7	–	–	–	–	–	–	–	
Gorsedd and Merllyn	–	–	30	30	–	–	4	–	–	8	12	42	–	–	–	–	113 16	28 0	–	
Grosvenor	–	–	24	24	–	–	–	–	–	7	7	31	–	–	–	–	20 0	–	–	
Great Holway	–	–	10	10	–	–	–	–	–	21	21	31	–	–	–	–	7 0	23 0	–	
Gwaenysgor	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	
Kilmorey	–	–	10	10	–	–	–	–	–	–	–	10	–	–	–	–	2 10	–	–	
Maesysafn	–	–	6	6	–	–	–	–	–	2	2	8	–	–	–	–	2 0	–	–	
New South Merllyn	–	–	4	4	–	–	–	–	–	–	–	4	–	–	–	–	24 1	–	–	
North Henblas	–	–	2	2	–	–	–	–	–	–	–	2	–	–	–	–	8 0	–	–	
North Hendre	–	–	100	100	–	–	18	–	–	33	51	151	–	–	–	–	1,808 5	–	–	
Pant y Buarth	–	–	4	4	–	–	–	–	–	2	2	6	–	–	–	–	7 0	–	–	
Pant y Mwyn	–	–	26	26	–	–	4	–	–	20	24	50	–	–	–	–	257 0	–	–	
Parry's	–	–	4	4	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–	
Pennant	–	–	12	12	–	–	2	–	–	1	3	15	244	–	–	–	22 7	–	–	
Penyrorsedd	–	–	4	4	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–	
Prince Patrick	–	–	38	38	–	–	10	–	–	10	20	58	–	–	–	–	75 0	–	–	
Pwll Gwen Llan	–	–	4	4	–	–	1	–	–	–	1	5	–	–	–	–	16 7	–	–	
Rhosesmor	–	–	–	–	–	–	–	–	–	2	2	2	–	–	–	–	–	–	–	
Rhydalyn	–	–	24	24	–	–	4	–	–	2	6	30	–	–	–	–	257 0	–	–	
St. David's	–	–	4	4	–	–	–	–	–	–	–	4	–	–	–	–	2 17	–	–	
St. Patrick's	–	–	8	8	–	–	–	–	–	–	–	8	–	–	–	–	–	–	–	
Sir Edward	–	–	5	5	–	–	–	–	–	–	–	5	–	–	–	–	6 0	–	–	
South Pant y ne	–	–	4	4	–	–	–	–	–	–	–	4	–	–	–	–	20 13	–	–	
Talacre	–	–	4	4	–	–	–	–	–	2	2	6	–	–	–	–	2 6	10 1	–	

Number of Persons employed in or about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males	Females.	Ages above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Underground.	Barytes.	Copper Ore.	Iron Ore.	Iron Pyrites. (*Mundic.*)	Lead Ore.	Zinc Ore.	Other Minerals.	Remarks.
													Tons.	Tons. cwt.	Tons.	Tons.	Tons. cwt.	Tons. cwt.		
FLINTSHIRE—*cont.*																				
Talargoch	–	3	316	319	–	–	40	–	–	69	109	428	—	—	—	—	1,310 0	2,595 0	—	
True Blue	–	–	4	4	–	–	–	–	–	2	2	6	—	—	—	—	3 0	—	—	
United	–	–	–	–	–	–	–	–	–	3	3	3	—	—	—	—	5 17	—	—	
Victor	–	–	25	25	–	–	5	–	–	6	11	36	—	—	—	—	48 0	—	—	
Wagstaff	–	–	4	4	–	–	1	–	–	1	2	6	—	—	—	—	131 9	—	—	
Wynn	–	–	6	6	–	–	–	–	–	4	4	10	—	—	—	—	—	—	—	
	–	3	752	755	–	–	89	–	–	209	298	1,053	244	—	—	—	4,155 11	2,656 1		
MERIONETHSHIRE.																				
Clogau	–	–	12	12	–	–	1	–	–	4	5	17	—	—	—	—	—	—	Gold ozs. dwts. grs. 697 12 15	
Drwsynant	–	–	6	6	–	–	–	–	–	–	–	6	—	—	—	—	—	—	—	
Glan Clwyd	–	–	–	–	–	–	–	–	–	4	4	4	—	—	—	—	6 0	—	—	
Glasdir	–	–	–	–	–	–	–	–	–	–	–	–	—	1 0	—	—	—	—	—	
Great Manod	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	—	—	
Penrhyndeudraeth	–	–	8	8	–	–	–	–	–	–	–	8	—	—	—	—	—	—	—	
	–	–	28	28	–	–	1	–	–	8	9	37	—	1 0	—	—	6 0	—		
MONTGOMERYSHIRE.																				
Berwyn Phosphorite	–	–	3	3	–	–	–	–	–	–	–	3	—	—	—	—	—	—	Phosphate of Lime Tons. 16	
Cae Conroy	–	–	1	1	–	–	–	–	–	–	–	1	—	—	—	—	—	—	—	
Caelan	–	–	6	6	–	–	–	–	–	–	–	6	—	—	—	—	—	—	—	
Central Van	–	–	4	4	–	–	–	–	–	2	2	6	—	—	—	—	—	—	—	
Cwmbyr	–	–	1	1	–	–	–	–	–	–	–	1	—	—	—	—	—	—	—	
Cwm Ricket and Maesnant	–	–	9	9	–	–	1	–	–	–	1	10	—	—	—	—	1 4	—	—	
Cyfartha	–	–	26	26	–	–	–	–	2	16	18	44	—	—	—	—	—	—	—	
East Van	–	–	15	15	–	–	–	–	–	6	6	21	—	—	—	—	—	—	—	
Glyn	–	–	5	5	–	–	–	–	–	4	4	9	—	—	—	—	10 16	—	—	
Great Dylife	–	–	82	82	–	–	11	2	8	23	44	126	—	21 10	—	—	603 0	—	—	
Great Gias	–	2	4	6	–	–	–	–	–	2	2	8	—	10 0	—	—	—	—	—	

Number of Persons employed in or about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages, 8 to 13. Males.	Females.	Ages, 13 to 18. Males.	Females.	Ages, above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Underground.	Barytes.	Copper Ore.	Iron Ore.	Iron Pyrites. (*Mundic.*)	Lead Ore.	Zinc Ore.	Other Minerals.	Remarks.
MONTGOMERYSHIRE—*cont.*													Tons.cwt.	Tons.cwt.	Tons.	Tons.	Tons. cwt.	Tons. cwts.	Tons.	
Geufron Gwestyn	–	–	10	0	–	–	–	–	–	3	3	13	—	—	—	—	—	—	—	
Llanerchyraur	–	–	8	8	–	–	3	–	3	1	7	15	—	—	—	—	—	—	—	
Llanidloes	–	–	18	18	–	–	2	1	2	6	11	29	—	—	—	—	18 0	52 0	—	
Llanrhaiadr	–	–	5	5	–	–	–	–	–	1	1	6	—	—	—	—	4 2	—	—	
Nant Iago	–	–	6	6	–	–	–	–	–	1	1	7	—	—	—	—	10 7	16 6	—	
New Llangynog	–	–	13	13	–	–	1	–	–	8	9	22	—	—	—	—	128 0	—	—	
Rhoswydol	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	—	—	
Snowbrook	–	–	8	8	–	–	–	–	–	4	4	12	—	—	—	—	—	—	—	
Van	–	–	346	346	–	–	35	–	4	233	272	618	—	—	—	—	5,800 0	2,100 0	—	
Van Consols	–	–	2	2	–	–	–	–	–	2	2	4	—	—	—	—	—	—	—	
West Wye Valley	–	–	25	25	–	–	10	4	6	5	25	50	—	—	—	—	220 0	40 0	—	
Wye Valley	–	1	35	36	–	–	10	4	6	5	25	61	—	—	—	—	185 0	—	—	
	–	3	34	637	–	–	73	11	31	322	437	1,074	—	31 10	—	—	6,980 9	2,208 6		
RADNORSHIRE.																				
St. Harmon	–	–	22	22	–	–	2	–	–	4	6	28	—	—	—	—	20 0	—	—	
SHROPSHIRE.																				
Ladywell	–	–	25	25	–	–	3	–	–	12	15	40	—	—	—	—	210 5	—	—	
Perkins Beach	–	–	6	6	–	–	1	–	–	1	2	8	—	—	—	—	27 14	—	—	
Roman Gravels	–	–	166	166	–	–	18	–	2	36	56	222	—	—	—	—	2,093 0	170 0	—	
Snailbeach	–	–	182	182	1	–	47	–	4	117	169	351	836 13 Sulphate.	—	—	—	2,498 15	188 11	Dross for walks, 327 tons 16 cwt.	
South Roman Gravels	–	–	11	11	–	–	–	–	–	1	1	12	—	—	—	—	—	—	—	
Tankerville	–	–	105	105	–	–	17	2	2	31	52	157	—	—	—	—	1,080 0	—	—	
West Tankerville	–	–	39	39	–	–	9	–	3	12	24	63	—	—	—	—	255 0	127 0	—	
Wotherton	–	–	4	4	–	–	–	–	–	–	–	4	325 0	—	—	—	—	—	—	
Wotherton	–	–	8	8	–	–	4	–	–	6	10	18	2,090 0	—	—	—	—	—	—	
	–	–	546	546	1	–	99	2	11	216	329	875	3,251 13	—	—	—	6,164 14	485 11		

Number of Persons employed in or about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages, 8 to 13. Males.	Females.	Ages, 13 to 18. Males.	Females.	Ages, above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Underground.	Barytes.	Copper Ore.	Iron Ore.	Iron Pyrites. (*Mundic.*)	Lead Ore.	Zinc Ore.	Other Minerals.	Remarks.
ISLE OF MAN.													Tons.	Tons.	Tons.	Tons.	Tons. cwt.	Tons. cwt.	Tons.	
Bell Abbey and Falcon Cliff	–	–	4	4	–	–	–	–	–	5	5	9	—	—	—	—	14 10	—	—	
Central Foxdale - -	–	–	68	68	1	–	18	–	1	18	38	106	—	—	—	—	330 0	—	—	
Foxdale - - -	–	8	223	231	37	–	34	–	3	109	183	414	—	—	—	—	1,958 19	—	—	
Great East Foxdale -	–	–	20	20	–	–	4	–	–	8	12	32	—	—	—	—	103 0	—	—	
Great Laxey - -	–	–	375	375	5	–	55	–	7	188	255	630	—	30	—	—	1,395 0	9,411 0	—	
Great Snaefell - - -	–	–	16	16	–	–	–	–	–	1	1	17	—	—	—	—	—	—	—	
Manx Mineral - - -	–	–	12	12	–	–	–	–	–	2	2	14	—	—	—	—	3 10	6 0	—	
Rushen - - - -	–	–	18	18	1	–	9	–	–	9	19	37	—	—	—	—	40 0	109 0	—	
	–	8	736	744	44	–	120	–	11	340	515	1,259	—	30	—	—	3,844 19	9,526 0		
IRON ORE MINES.																				
FLINTSHIRE.																				
Bodfari - - - -	–	–	6	6	1	–	1	–	–	2	4	10	—	—	—	—	—	—	Limestone Tons - 505	
Henfryn - - - -	–	–	3	3	–	–	–	–	–	–	–	3	—	—	—	—	—	—	—	
	–	–	9	9	1	–	1	–	–	2	4	13	—	—	—	—	—	—		
LIMESTONE MINES.																				
DENBIGHSHIRE.																				
Chirk Castle - -	–	–	–	–	–	–	2	–	–	38	40	40	—	—	—	—	—	—	Lime and limestone, 12,748 tons.	
SHROPSHIRE.																				
Hatch - - -	–	–	11	11	–	–	–	–	–	2	2	13	—	—	—	—	—	—	Tons.	
Lilleshall - - - -	–	–	18	18	–	–	–	–	–	16	16	34	—	—	—	—	—	—	Limestone - 4,600	
																			Do. - 7,716	
	–	–	29	29	–	–	–	–	–	18	18	47	—	—	—	—	—	—	12,316	

Number of Persons employed in or about the Mines, &c.—*continued.*

SLATE MINES.

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. 8 to 13. Males.	Females.	13 to 18. Males.	Females.	Above 18. Females.	Males.	Total.	Total Number of Persons employed Above and Under Ground.	Slate.
CARNARVONSHIRE.													Tons cwt.
Bugail	–	–	4	4	–	–	9	–	–	42	51	55	2,747 0
Clogwyn-y-Fuwch	–	–	11	11	–	–	–	–	–	3	3	14	201 9
Port Bangor	–	–	5	5	–	–	1	–	–	3	4	9	–
Rhiw Bach	–	–	4	4	–	–	1	–	–	2	3	7	220 2
	–	–	24	24	–	–	11	–	–	50	61	85	3,168 11
MERIONETHSHIRE.													Tons.
Aberllefenny	–	–	88	88	–	–	9	–	–	72	81	169	4,732
Alltgoch	–	–	1	1	–	–	–	–	–	1	1	2	–
Braich Du	–	–	–	–	–	–	–	–	–	2	2	2	12
Braich Goch	–	–	109	109	1	–	24	–	–	89	114	223	9,081
Bryneglwys	–	–	154	154	–	–	25	–	–	84	109	263	7,468
Bwlch y Slater	–	–	13	13	–	–	2	–	13	–	15	28	–
Carlyle	–	–	55	55	–	–	2	–	–	37	39	94	2,756
Craglog	–	–	11	11	–	–	1	–	–	17	18	29	308
Croesor, New	–	1	31	32	–	–	2	–	–	17	19	51	790
Crown	–	–	6	6	–	–	–	–	–	–	–	6	2
Cwmorthin	–	1	275	276	–	–	30	–	–	220	250	526	13,968
Cymmerau	–	–	23	23	–	–	–	–	–	11	11	34	1,900
Diphwys Casson	–	–	16	16	–	–	20	–	–	107	127	143	4,979
Drum	–	–	–	–	–	–	–	–	–	30	30	30	–
Gaewern	–	1	45	46	–	–	8	–	–	57	65	111	1,816
Llechwedd	–	–	199	199	2	–	54	–	–	193	249	448	17,500
Maenofferen	–	–	44	44	–	–	–	–	–	46	46	90	5,262
Moelfferna and Deeside	–	–	40	40	–	–	12	–	–	20	32	72	1,250
Oakeley, Upper	–	1	205	206	1	–	30	–	–	209	240	446	12,281
Oakeley, Middle	–	1	174	175	–	–	27	–	–	141	168	343	16,839
New Rhosydd	–	–	63	63	–	–	15	–	–	74	89	152	4,525
Palmerston	–	3	320	323	–	–	46	–	–	404	450	773	39,418
Pant Mawr	–	–	22	22	–	–	–	–	–	2	2	24	39
Park	–	–	11	11	–	–	–	–	–	13	13	24	550
Penarth	–	–	10	10	–	–	2	–	–	8	10	20	372
Ratgoed	–	–	18	18	–	–	–	–	–	12	12	30	946
Voelgron	–	–	9	9	–	–	1	–	–	3	4	13	180
Votty and Bowydd	–	1	225	226	–	–	27	–	–	112	139	365	8,220
Wrysgaen	–	–	46	46	–	–	7	–	–	29	36	82	2,095
	–	9	2,213	2,222	4	–	344	–	13	2,010	2,371	4,593	157,289
MONTGOMERYSHIRE.													
Brithdir	–	–	22	22	–	–	–	–	–	20	20	42	–

THE YEAR'S GENERAL RESULTS.

Persons employed and Accidents.

Underground:			
Males.	Under 13 years of age	–	–
	„ 16 „	–	40
	Above 16 „	–	6,880
			6,920
Surface:			
Females.	Under 13 years of age	–	10
	„ 18 „	–	116
	Above 18 „	–	216
			342
Males.	Under 13 years of age	–	121
	„ 18 „	–	1,122
	Above 18 „	–	3,909
			5,152
	Making a total of	– –	12,414

A decrease of 1,058 upon the total shown by last year's Returns.

The fatal accidents were 12 in number, and caused 13 deaths, thus giving 1 accidental death for every 955 persons employed; and, making the usual distinction between underground and surface, we obtain 1 death in 629 persons employed underground, and 1 in 2,747 employed on the surface.

The number of persons employed in the slate mines was as follows:—

Underground - - - -	2,268
Surface - - - - -	2,452
Making a total of -	4,720

And the fatal accidents which occurred in them were 6 in number, and caused the same number of deaths, thus making 1 in 786 of the persons employed.

Comparing the results obtained from the statistics of fatal accidents during the last four years we have the following:—

	1875.	1876.	1877.	1878.
Number of persons employed -	12,654	13,001	13,472	12,414
Deaths by accident - -	31	16	23	13
Giving respectively - - -	1 in 408	1 in 812	1 in 586	1 in 955
In the slate mines during those years the proportions were - - -	1 in 332	1 in 924	1 in 276	1 in 786
In the metal mines the proportions were	1 in 508	1 in 762	1 in 1,700	1 in 1,099
In the coal mines of Great Britain and Ireland the proportions were -	1 in 430	1 in 551	1 in 409	

The results thus obtained cannot but be regarded as highly satisfactory. The Act has certainly saved a large number of lives since it has been in operation; and there can be no doubt that when those who at first complained most of being harassed by its requirements are made acquainted with these figures, they will rejoice as much as any one to find that the dangers to which the miner is exposed have been so materially reduced.

Dr. C. Le Neve Foster, in his Report for last year, makes an interesting comparison between the death rate in his district and those of two mining districts on the continent. In his district the death rate per 1,000 was 1·50, in North Germany is was 1·47, while in Saxony it was under 1 per 1,000.

My present statistics compare favourably with these, giving as a death rate 1·04 per 1,000 for last year, the lowest recorded, except those of the mines of Saxony.

In the course of the year three fatal accidents, which do not come under the Act, occurred in or about mines in my district. The first was at the Cwmystwyth Mine, in the county of Cardigan. A boy named William Jones, who was employed in those mines during the day, went, after his day's work was over, to a level about a mile from his working place, and long ago abandoned, for the purpose of taking away some of the timbering of the level for use as firewood; and it was supposed that while he was thus employed a quantity of stuff, which he loosened, fell upon him and caused his death. A child of 11 years who had accompanied him gave the alarm, and a neighbour on going to the spot found that the deceased had been completely buried in the stones and rubbish which had come down. The entrance to the level was duly fenced.

Another accident of a singular nature took place at the West Wye Valley Mine to one Samuel Cock, a miner of 50 years of age, on Sunday the 18th August. No evidence could be obtained as to its mode of occurrence. The agent of the mine deposed at the inquest that he had seen the deceased a little after 2 o'clock in the afternoon. Nothing more was seen of him until he was found dead at the bottom of a shaft, about 7 o'clock in the evening, by another workman whose duty required him to go down at that time.

The coroner's jury returned a verdict of "Found dead."

The third in this class occurred at the Parys Mines, in the Isle of Anglesey, on the 16th September, to a child of five years of age. It appeared from the evidence that the little fellow, accompanied by others of his own age, went to the mines while rambling about during their playtime, and noticing the oscillating movements of the sweep rod of a pumping engine, climbed upon it for the purpose of enjoying a ride. While they were thus amusing themselves, the deceased child went so near the crank that his head was severed from his body when the rod and the crank were passing each other.

I received notices of these accidents, and attended the inquests.

The quantities of minerals raised during the last seven years were as follows :—

	1872.	1873.	1874.	1875.	1876.	1877.	1878.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Barytes	6,957	4,644	3,941	5,796	4,749	2,537	3,495
Bluestone	984	734	1,008	650	50	—	360
Chloride of barium	65	—	—	—	—	—	—
Cobalt ore	—	—	—	—	—	—	99
Copper ore	7,334	4,693	4,474	4,239	3,436	3,816	2,518
Copper precipitate	(Formerly included with copper ores.)				519	420	453
Dross spar	—	14	25	35	66	142	328
Fire sand	—	—	—	—	—	756	—
				Oz. dts. grs.	Oz. dts. grs.	Lbs. oz. dts. grs.	Oz. dts. grs.
Gold	—	—	—	385 0 12	288 18 6	11 7 4 13	697 12 15
Gold quartz	—	—	—	122	—	—	—
Auriferous sulphurets.	—	—	—	10	—	2 19 0 8	—
Iron ore	4,852	8,374	3,122	2,267	—	498	378
Iron pyrites	2,597	2,512	2,470	1,860	1,502	1,168	804
Lead ore	37,639	33,923	34,876	34,617	33,410	32,350	32,185
Limestone	—	—	—	12,500	10,613	11,401	25,669
Manganese	50	—	40	—	—	—	—
Ochre and umber	3,090	2,450	3,012	3,955	2,232	2,440	2,302
Phosphate of lime	—	—	479	122	185	6	16
Sand	—	867	—	272	—	—	—
Slates	(No returns.)		151,744	149,565	151,008	162,086	160,457
Zinc ore	13,690	10,083	16,177	17,816	17,657	17,301	18,589

From which it appears that, with one exception,—that of copper ore,—the more important mine products show on the whole a very small decrease upon the quantities obtained in the year 1877. Some, indeed, show an increase; but, taking them altogether, and estimating them according to the average prices of the year, a very considerable reduction is found to have taken place in their commercial value. I compute them approximately at 990,500*l.*, being a money value of 127,596*l.* less than in 1877, while the cost of raising and bringing to market was, including all charges, probably about 1,067,000*l.*, thus showing an aggregate loss of 76,500*l.* against that of 167,302*l.* in 1877. This is financially an improvement, upon which the mining interests involved might at first sight appear to deserve congratulation, but, on examining all the figures, there will possibly be found reasons for fearing that it is specious and temporary. The diminution of 600 hands in the underground department, shown by the summary of persons employed to have taken place during the year, may, without doubt, be regarded as an indication that the existing commercial depression has had the effect of stopping or retarding many exploratory operations and unremunerative works; while, on the other hand, the quantity of minerals produced goes far to prove that a strong effort is made in productive mines to compensate for depreciation in values by maintaining or increasing the returns of ore.

If this conclusion is correct, the present condition of affairs is one which must speedily give way to another still less satisfactory.

Bunches of ore do not last long; the richest mines ultimately become exhausted; and when exploratory operations cease in any mining district, or fail to make fresh discoveries, the doom of that district is soon sealed. Hence it is to a great extent that in some places in the course of my travels I find numerous abandoned mines of which nothing remains but ruins of engine-houses and heaps of waste which denote former activity and prosperity. The remedy for this evil is one which will not readily be applied. When mines are prosperous few shareholders are willing that reserves of ore underground shall be allowed to remain to meet bad times, or that a balance at the bank be kept to stem over a temporary state of poverty in the mine; and when, unfortunately, either event arrives, an appeal for assistance does not always elicit the required response. This often causes the abandonment of properties whose value might be greatly prolonged by proper trials judiciously conducted. I am glad to say that some mines in my district are carried on with a view no less to future prosperity than to immediate profit; but that the hand-to-mouth system of working exists to such a degree as to cause serious damage to mining, there is unhappily abundant evidence to adduce.

I attended all the inquests, except one which was held while I was at too great a distance to reach it in time. I inquired carefully into the nature of every accident, fatal and non-fatal, which appeared to demand my attention, and, in every case in which I considered it necessary, recommended measures conducive to increased safety.

I attended the hearing of the cases of prosecutions instituted, and, in those instances in which I was the witness to a contravention of the statute, gave the necessary evidence.

In addition to these duties, I have during the year travelled officially, by rail, road, and steamboat, a distance of at least 10,000 miles, and made 241 visits, by far the greater part of which were made without previous notice.

While thus endeavouring, to the best of my ability, to carry out your wishes that the Act shall be observed with uniform regularity in all the mines of my district, I have had correspondence and other writing work which would almost furnish sufficient employment for a clerk of ordinary powers. My letters alone considerably exceeded 4,000 in number. You were pleased to allow me to take the month of November as a holiday, and to ask Dr. Foster to take my district in my stead; but, owing to legal matters which arose, in which my colleague's services were of no avail, I was compelled to return to my duties six times in the course of that month.

I have received a large number of complaints from numerous and very different sources. A good many were anonymous. In all these cases I have made careful inquiries into the matters complained of; and although, as a rule, I found genuine grounds for complaint, I have had reason to fear that a few of the more trivial were prompted by feelings of personal pique.

I had the honour to receive your intimation that you had been informed that, owing to the defective ventilation of certain mines in my district, phthisis was abnormally prevalent among the miners they employed. This became the subject of a Special Report which I made to you at the time, after an inquiry into the subject. The result will perhaps be best illustrated by a quotation from that Report:—"That phthisis causes excessive mortality among "the miners employed in these mines is unhappily too true, but I do not think it has been "attributed to the proper cause, and can hardly believe that the state of ventilation in "itself has at any time been so bad as to make that complaint general among the workmen. "I am inclined to the opinion that the supply of fresh air has not, as a rule, been seriously "deficient, and that the prevalence of the disease must be mainly due to two other causes.

"One is the practice, which obtains too extensively among the miners, of working in the "clothes they habitually wear, although many of them walk three or four miles to the mines, "and often go to their work and return to their homes in garments thoroughly drenched "by rain.

"The other is the practice of boring holes for blasting without putting in water. This "produces a quantity of dust of a highly deleterious character, which the men who are "boring cannot fail to inhale largely during the deep inspirations attending violent "exertion."

I suggested also that it would be well to ascertain whether the diagnosis in the cases of miners who die prematurely does not indicate miner's, or, as professionally termed, "grinder's asthma," rather than phthisis in the ordinary form.

The sum of 25*l.* lying in the joint names of the Vicar of Abergele and myself on behalf of the widow and children of a miner, has not been drawn upon since my last Report. The Vicar has kindly undertaken to inform me if any necessity arises for handing over a portion of the money; and having heard nothing from him upon the subject, I am happy to conclude that the little business she started on her husband's death has kept her and her small family free from want.

I have, &c.

T. F. EVANS.

The Right Hon. R. Assheton Cross, M.P.,
H.M. Secretary of State for
the Home Department, Whitehall.

LIST OF MINES classed under the METALLIFEROUS MINES REGULATION ACT, in MR. T. F. EVANS' DISTRICT, 1878.

Owner or Company, and Postal Address.	Name of Mine.	Situation.	Owner or Agent.*
ANGLESEY.			
1. Mona Mine Co., Amlwch	Mona	Near Amlwch	William Hughes.
2. Morfa Du Mine Co., Limited, Amlwch	Morfa Du	Ditto	T. Mitchell.
3. Parys Mountain Mines Co., Limited, Amlwch	Parys Mountain	Ditto	Ditto.
4. N. Spargo and Robert Knapp, Llanrwst, Holyhead and Llanrwst.	West Mona	Clwchdernog Llanddausant.	*Nicholas Spargo.*
CARDIGANSHIRE.			
1. Aberystwyth Mining Co., Ponterwyd, near Aberystwyth.	Aberystwyth	Ponterwyd	J. H. Croucher.
2. Blaen Ceulan United Mining Co., Limited, Talybont, Glandovey.	Blaen Ceulan	Near Talybont	Jonathan Gill.
3. R. Smith, 4, New Bond Street, London	Blaenceunant	Llanfihangel-y-Creuddyn.	Geo. Wright.
4. Bwlchstellan Mining Co., Ponterwyd, Aberystwyth.	Bwlchstellan	Near Goginan	N. Bray. (Suspended.)
5. Bwlch United Mining Co., Limited, Ponterwyd, Aberystwyth.	Bwlch United	Ponterwyd	N. Bray.
6. C. E. Hayward, Winchester, Cambrian Mining Co., Limited.	Caenant and Pencraigddu.	Near Goginan	J. Phillips.
7. Cambrian Mines, viâ Glandovey	Cambrian Mines	Talybont	T. Glanville.
8. Caron Lead Mining Co., Limited, Ystrad Meurig, R.S.O., South Wales.	Caron	Near Strata Florida	J. Kitto.
9. Jno. B. Masefield, Ledbury, Herefordshire	Cefngwyn	Elerch	Jno. Hughes.
10. Clara Consols Mining Co., Limited, Ponterwyd, Aberystwyth.	Clara Consols	Ponterwyd	N. Bray.
11. Court Grange Mine Co., Limited, Bow Street, R.S.O.	Court Grange	Bow Street	J. G. Green.
12. Crown Mining Co., Limited, 14A, Austin Friars, London, E.C.	Crown	Ponterwyd	David Daniel.
13. Geo. Underwood, Avonside, Bath	Cwmbrwyno	Goginan	Jno. Paull. (No Return.)
14. W. Jones, Llwynygroes, Lampeter	Cwmerfin	Ditto	Ditto. (No Return.)
15. Cwmorog Mining Co., Limited, Ponterwyd, Aberystwyth.	Cwmorog	Ponterwyd	Jas. Corbett. (No Return.)
16. Jno. Taylor and Sons, 6, Queen Street Place, London, E.C.	Cwmystwyth	Llanfihangel-y-Creuddyn.	J. B. Rowse.
17. De Broke Mining Co., Limited, Ponterwyd, Aberystwyth.	De Broke	Near Ponterwyd	J. Phillips.
18. C. Herbert Stokes, Glandovey, R.S.O., Cardiganshire.	Dolfawr	Near Aberystwyth	*C. H. Stokes.* (No Return.)
19. Eaglebrook Mining Co., Limited, 16, Great Winchester Street, London.	Eaglebrook	Elerch	A. Francis.
20. John Taylor and Sons, 6, Queen Street Place, London, E.C.	East Darren	Near Goginan	Jas. Garland.
21. C. Herbert Stokes, Glandovey, R.S.O., Cardiganshire.	East Dolwen	Near Devil's Bridge	*C. H. Stokes.* (Suspended.)
22. Elgar Silver Lead Mining Co., Limited, Bow Street, R.S.O.	Elgar	Near Bow Street	J. G. Green.
23. R. Girdwood, Tanfield, Edinburgh	Esgair Mwyn	Ystrad Meurig	Wm. A. Green.
24. Richard Attenborough, Whitley Grove, Reading.	Florida	Strata Florida	Edwd. Halse.
25. Frongoch Lead Mine Co., Limited, Devil's Bridge, near Aberystwyth.	Frongoch	Devil's Bridge	John Kitto.
26. R. Girdwood, Tanfield, Edinburgh	Gertrude	Ditto	Geo. Green. (Suspended.)
27. Goginau and Level Newydd Mining Co., Limited, Goginan, near Aberystwyth.	Goginan	Seven miles from Aberystwyth.	W. Hy. Paull. (Suspended this year—1879.)
28. R. Girdwood, Tanfield, Edinburgh	Great Darren	Goginan	William Jones.
29. Great West Van Mining Co., Limited, Ponterwyd, Aberystwyth.	Great West Van	Ponterwyd	Wm. Bramwell. (In liquidation.)
30. Grogwinion Lead Mine Co., Limited, Pontrhydygroes, near Aberystwyth.	Grogwinion	Pontrhydygroes	John Kitto.
31. John Taylor and Sons, 6, Queen Street Place, London, E.C.	Lisburne	Ditto	Peter Garland.
32. C. E. Hayward, Winchester	Llawrcwmbach	Near Goginan	J. Phillips.

* The name of the Owner appears in italics.

List of Mines in Mr. T. F. Evans' District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Situation.	Owner or Agent.
Cardiganshire—*continued.*			
33. Melindwr Lead Mining Co., Limited, Goginan, Aberystwyth.	Melindwr -	Near Aberystwyth	John Kitto.
34. Monydd Gorddu Silver Lead Mine Co., Limited, Bow Street, R.S.O.	Monydd Gorddu -	Bow Street - -	Jas. G. Green.
35. C. Herbert Stokes, Glandovey - -	Mines Royal (Drosgol and Camdwrmawr).	Near Plynlimmon	*C. H. Stokes.* (No Return.)
36. New Bronfloyd Co., Limited, Bow Street, R.S.O., viâ Salop.	New Bronfloyd -	Five miles east of Aberystwyth.	Thos. Kemp.
37. New Tyllwyd Silver Lead Mining Co, Limited, near Aberystwith, and 164, Gresham House, Old Bond Street, London.	New Tyllwyd -	Goginan - - -	Walter Eddy.
38. Plynlimmon Lead Mining Co., Limited, Ponterwyd, Aberystwyth.	Plynlimmon -	Ponterwyd -	Jno. Garland.
39. Powell Consolidated Mining Co., Limited, Ponterwyd, Aberystwyth.	Powell Consolidated	Ditto - -	N. Bray.
40. Red Rock Mining Co., Limited, Crosswood, Aberystwyth.	Red Rock - -	Near Crosswood -	J. Kitto.
41. Rheidol Mining Co., Limited, 110, Cannon Street, London.	Rheidol - -	- - -	Jno. Ridge. (In liquidation.)
42. South Cwmystwyth Lead Mining Co., Limited, near Devil's Bridge, Aberystwyth.	South Cwmystwyth	Gwnnws, Lower -	Joseph Mitchell. (No Return.)
43. J. H. Murchison, 8, Austin Friars, London, E.C.	South Darren -	Near Goginan -	Henry James.
44. Richard Attenborough, Whitley Grove, Reading.	South Lisburne -	Strata Florida -	Edwd. Halse.
45. Talybont Silver Lead Mining Co., Limited, Talybont, viâ Glandovey.	Talybont - -	Glandovey - -	Thos. Glanville.
46. C. Herbert Stokes and Co., Glandovey, R.S.O.	Tanyrallt -	Ditto - -	*C. H. Stokes.*
47. Temple Mining Co., Ponterwyd, near Aberystwyth.	Temple - -	Near Ponterwyd -	J. H. Croucher.
48. N. Bray and J. Phillips, Ponterwyd -	Tynyfron - -	Ponterwyd -	J. Phillips.
49. Jno. Taylor and Sons, 6, Queen Street Place, London, E.C.	Vaughan - -	Goginan - -	Jas. Garland.
50. Stephen Barker and Alfred E. Wenham, 50, Ann Street, Birmingham.	West Esgair Lle -	Ponterwyd - -	A. E. Wenham.
51. West Goginan Lead Mining Co., Limited, Goginan, Aberystwyth.	West Goginan -	Near Goginan -	John Kitto.
52. C. Herbert Stokes, Glandovey - -	Ynys - -	Near Ynyslas -	*C. H. Stokes.*
53. Ystumtuen Mining Co., near Ponterwyd -	Ystumtuen - -	Cwm Rheidol -	Robt. Wren.
Carnarvonshire.			
1. Aberllyn Mining Co., Limited, Llanrwst -	Aberllyn - -	Near Llanrwst -	Jno. Roberts.
2. H. Tudor Owen and others, Llanrwst -	Alltwen - -	Bettws-y-Coed -	Morris Evans.*
3. Assheton Mining Co., Limited, Abersoch, Pwllheli.	Assheton - -	Llanengan - -	Joseph Garland.
4. Bettws-y-Coed Lead Mining Association, Limited, Llanrwst.	Bettws-y-Coed -	Near Bettws-y-Coed	H. T. Haley.
5. Robert Owen and others - - -	Bronfadog -	Near Trefriw -	Morris Evans.*
6. John Roberts, Quay House, Carnarvon -	Bryncenadon -	Geirionydd Lake -	Ditto. (No Return.)
7. H. T. Cartwright, Bridge Street Chester -	Bryneisteddfod -	Nant Bwlch-yr-Heyrn.	Ditto.
8. Thomas Goddard and others, Llanrwst -	Bwlch-y-Groes -	Near Bod Lake -	Ditto.
9. Messrs. E. A. Hill and others, Liverpool -	Cae Coch - -	Near Trefriw -	Ditto.
10. Evans, Williams, and Jones, near Llanrwst	Caegwyn - -	Near Bod Lake -	Ditto.
11. J. J. Lewis and others, Trefriw, nr. Conway	Caerhegla - -	Trefriw - -	Ditto.
12. Clementina Mining Co., Gracechurch Buildings, London.	Clementina -	Tyntwll near Llanrwst.	Jno. Roberts.
13. Coedmor Pool Mining Co., 86, London Wall London, E.C.	Coedmor Pool -	Near Llanrwst -	W. McFarlane.
14. Cwmdwyfor Mining Co., Limited, St. Clement's House, St. Clement's Lane, London, E.C.	Cwm Dwyfor -	Llanfihangel-y-Pennant.	Joseph Jewell. (Suspended.)
15. John Davies, 6, Great St. Helen's, London	Cwm Lanerch -	Bettws-y-Coed -	(No Return.)
16. Daugoch Mining Company, Abersoch, Pwllheli.	Daugoch - -	Absersoch, near Pwllheli.	Geo. F. Pearson.
17. D'Eresby Consols Mining Co., Limited, Llanrwst.	D'Eresby Consols -	Near Llanrwst -	Jno. Roberts.

* Barmaster to the Gwydyr Estate.

LIST of MINES in MR. T. F. EVANS' DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Situation.	Owner or Agent.
CARNARVONSHIRE—*continued.*			
18. De Eresby Mountain Mining Co., Limited, Gracechurch Buildings, Gracechurch Street, London.	De Eresby Mountain	Near Llanrwst -	Jno. Roberts.
19. Derwen Deg and Panol Gwyn Copper and Lead Mining Co., Limited, 12, Baltic Buildings, Red Cross Street, Liverpool.	Derwen Deg -	Vale of Conway -	Robert Morris.
20. Drws-y-Coed Mining Co., Limited, Nantlle Vale, Carnarvon.	Drws-y-Coed -	Nantlle Vale -	Thomas Lewis.
21. J. C. King, Hope, Mold - - -	Glyn - -	Glyn Capel Curig -	Morris Evans.*
22. H. Tudor Owen and others, Llanrwst -	Gorlanfarchog -	Parish of Trewydyr	Ditto.*
23. Llanrwst Lead Mining Co., Limited, Llanrwst.	Llanrwst - -	Bwlch-yr-Heyrn -	Robt. Knapp.
24. John Evans and others, Llanrwst - -	North Willoughby	Near Geirionydd Lake.	Morris Evans.
25. Pandora Mining Co., Limited, 8, Austin Friars, London.	Pandora - -	Trefriw, near Conway.	Hy. Nottingham.
26. Port Nigel Lead Mining Co., Limited, Abersoch, near Pwllheli.	Port Nigel - -	Llanengan - -	Joel Manley.
27. Trefriw Mining Co., Trefriw - -	Rheuadrwst -	Nant near Llanrwst	Morris Evans.
28. Tan-y-bwlch and Bwlch-y-tocyn Mining Co., Limited, Abersoch, near Pwllheli.	Tan-y-bwlch -	Abersoch - -	*Geo. F. Pearson.*
29. Vale of Conway Mining Co., Limited, Llanrwst.	Vale of Conway -	Nant Bwlch-yr-Heyrn.	Morris Evans.*
30. West Assheton Mining Co., Limited, Abersoch, near Pwllheli.	West Assheton -	Llanengan - -	John Craze.
DENBIGHSHIRE.			
1. Bodidris Mining Co., Limited, Llanarmon, near Mold.	Bodidris - -	Llanarmon, near Mold.	H. Hotchkiss.
2. Bryn Alyn Lead Mining Co., Limited, Llanarmon, near Mold.	Bryn Alyn -	Ditto -	Wm. Clemence.
3. Denbighshire Consolidated Mining Co., Limited, 30, Great St. Helen's, E.C., London.	Denbighshire Consolidated.	Near Mold -	Rupert Prince.
4. Dyffryn Aled Lead Mining Co., Limited, Abergele.	Dyffryn Aled -	Near Llanarmon -	*P. W. Yorke.* (Suspended.)
5. C. B. Dyer and Co., Amlwch, Llangollen or Amlwch.	Eglwyseg Extension.	Near Llangollen -	*C. B. Dyer.*
6. Minera Mine Co., Limited, Minera, near Wrexham.	Minera - -	Minera, near Wrexham.	Josiah Ball.
7. Minera Mountain Lead Mining Co., Limited, Minera, near Wrexham.	Minera Mountain -	Ditto -	Sampson Mitchell.
8. John Samuel and George Dawes, Llanferres.	Pant Du and Waen Lâs.	Llanferres -	*J. Dawes.*
9. Park Lead Mining Co., Limited, Minera, near Wrexham.	Park Lead -	Minera - -	Sampson Mitchell.
10. Plas Du and Park Lead Mining Co., Limited, Llanarmon, near Mold.	Plas Du and Park	Llanarmon - -	Wm. Evans.
FLINTSHIRE.			
1. W. D. Hargreaves and others, W. D. Hargreaves, Fron, near Mold.	Bryn Coch and East Pant-y-Mwyn Union.	Gwernaffield, near Mold.	*Wm. D. Hargreaves.*
2. Celyn Bog Silver Lead Mining Co., Holywell.	Celyn Bog - -	Celyn, Whitford -	F. E. Povah.
3. Mr. John Whitehouse, Atlas Works, Horseley Fields, Wolverhampton.	Chwarel Las -	Halkyn Mountain -	John Jones.
4. Clwt Militia Mining Co., Holywell - -	Clwt Militia -	Holywell - -	W. J. Grimshaw.
5. William Wasley, near Mold - -	Deborah - -	Near Mold -	*W. Wasley.*
6. Fagnallt Mine Co., Halkyn, near Holywell	Fagnallt - -	Halkyn - -	Richard Edwards.
7. John Clay, Rhyddlan - - -	Foel Hiraddug -	Foel Hiraddug -	M. A. Gage.
8. Fron Hall United Lead Mining Co., Limited, Fron Hall, near Mold.	Fron Hall - -	Near Mold -	Jno. Mansbridge.
9. Golden Grove Mine Co., Limited, Gwaenysgor, near Rhyl.	Golden Grove -	Gwaenysgor -	Rupert Prince.
10. Gorsedd and Merllyn Consols Mining Co., Limited, Gorsedd, near Holywell.	Gorsedd and Merllyn	Gorsedd - -	Ditto.
11. Grosvenor Lead Mining Co., Limited, 59, Seel Street, Liverpool.	Grosvenor -	Halkyn, Holywell	H. B. Vercoe.

* Barmaster to the Gwydyr Estate.

LIST of MINES in MR. T. F. EVANS' DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Situation.	Owner or Agent.
FLINTSHIRE—*continued.*			
12. Gwaenysgor Mine Co., Limited, Gwaenysgor, near Rhyl.	Gwaenysgor -	Gwaenysgor, Rhyl	Wm. Sandoe.
13. Hazel Grove Mining Co., Limited, Holywell	Hazel Grove -	Brynford - -	David Jones.
14. Holway Mining Co., Limited, Holywell -	Holway - -	Holywell - -	John Kemp.
15. Jonathan Gill, 3, Church Street, Manchester	Kilmorey - -	Ditto - -	*Jonathan Gill.*
16. E. Sunderland, Rose Hill, Handsworth, Birmingham.	Llwynycosyn -	Ysceifiog - -	John Jones. (Suspended.)
17. Thompson, Ollis, and Williams, Argoed House, Mold.	Maes-y-Safn -	Near Mold - -	Thos. Ollis. (Suspended.)
18. New South Merllyn Mining Co., Limited, 30, Great St. Helen's, E.C., London.	New South Merllyn	Near Holywell -	Robt. Rowlands.
19. North Henblas Mining Co., Limited, near Holywell.	North Henblas -	Ditto - -	*E. W. Bird.*
20. North Hendre Mining Co., Limited, near Mold.	North Hendre -	Parish of Halkyn -	Goodman Ellis.
21. North Patrick Lead Mining Co., Limited, 86, London Wall, E.C., London.	North Patrick -	Halkyn - -	John Woolcock. (Suspended.)
22. Pant-y-Buarth Mine Co., Gwernaffield, Mold.	Pant-y-Buarth -	Gwernaffield -	Edwd. Jones.
23. Pant-y-Mwyn Lead Mining Co., Limited, 57, Whitechapel, Liverpool.	Pant-y-Mwyn -	Near Mold - -	E. Carver.
24. Parry's Mine Co., Greenfield, Holywell -	Parry's Mine -	Holywell - -	Jno. Roberts.
25. Pennant Mining Co., Limited, St. Asaph -	Pennant - -	Near St. Asaph -	Jno. Kemp.
26. Penyrorsedd Mining Co., Hendre Mines, near Mold.	Penyrorsedd -	Northop Parish -	John Lloyd.
27. Prince Patrick Lead Mining Co., Limited, 59, Seel Street, Liverpool.	Prince Patrick -	Halkyn, Holywell -	H. B. Vercoe.
28. Richard Evans and Co., Flint - -	Pwll Gwen Llan -	Halkyn, near Holywell.	Edwd. Williams.
29. Rhosesmor Mine Co., Limited, 16, Corn Exchange Chambers, Chester.	Rhosesmor -	Ditto - -	Thos. Julian.
30. Rhydalun Mine Co., Rhydymwyn, Mold -	Rhydalun -	Near Rhydymwyn	Matt. Francis.
31. St. David's Lead Mining Co., Limited, Pantasa, Holywell.	St. David's - -	Pantasa - -	Jno. Jones.
32. St. Patrick Lead Mining Co., Limited, Holywell.	St. Patrick - -	Halkyn - -	Wm. Francis.
33. Cooper and Harding, Manchester -	Sir Edward -	Near Holywell -	Joseph Eustice.
34. Edwin Lloyd and Co., Ffynon Oswallt, Holywell.	South Pant-y-Ne -	Grangefield, near Holywell.	Thos. Price.
35. Talacre Mining Co., Gronant, Holywell -	Talacre - -	Gronant, Holywell	R. V. Kyrke.
36. Talargoch Mining Co., Limited, Rhyl -	Talargoch - -	Dyserth, near Rhyl	Wm. Smith, Sec.
37. Thomas Ollis, Argoed House, Mold -	True Blue - -	Mold Mountain, near the Loggerheads.	*Thomas Ollis.* (Suspended.)
38. United Lead Mining Co., Limited, 24, James Street, Liverpool.	United - -	Near Mold - -	Wm. Wasley.
39. Victor Lead Mining Co., Limited, 59, Seel Street, Liverpool.	Victor Lead - -	Rhydymwyn -	H. B. Vercoe.
40. Jones and Co., Halkyn - - - -	Wagstaff - -	Halkyn - -	Thos. Jones.
41. West Milwr Mines Co., Limited, Holywell	West Milwr -	Near Holywell -	Wm. Francis. (Suspended.)
42. Thompson and Ollis, Argoed House, Mold	Wynn - -	Llanarmon - -	*Thomas Ollis.* (Suspended..)
MERIONETHSHIRE.			
1. The Gold Company, 9, King's Arms Yard, E.C., London.	Cefn Coch Gold -	Llanelltyd - -	R. H. Williams. (No Return.)
2. Clogau Company, Limited, St. Peter's Close, Sheffield.	Clogau - -	Bont Ddu, Llanaber	W. B. Davies.
3. Welsh Mineral Co., 4, Broad Sanctuary, London, S.W.	Drwsynant -	Drwsynant - -	Thos. P. Thomas.
4. Glan Clwyd Lead Mining Co., Limited, Derwen, near Corwen.	Glan Clwyd -	Clegir Mawr -	C. E. Wilson, Secy. *W. H. Heap.*
5. Glasdir Mining Co., Limited, 4, New Broad Street, London, E.C.	Glasdir - -	Llanfachreth -	Jno. Rowe.
6. B. L. Barrow - - - - -	Great Manod -	Festiniog - -	Jno. Roberts.
7. C. Herbert Stokes, Glandovey - -	Mynydd Nodol -	Near Bala - -	*C. H. Stokes.* (No Return.)
8. Penrhyndeudraeth Lead Mining Co., Limited, Penrhyndeudraeth, N. Wales.	Penrhyndeudraeth	Llanfrothen -	M. H. Whitford.

LIST of MINES in MR. T. F. EVANS' DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Situation.	Owner or Agent.
MONTGOMERYSHIRE.			
1. The Aberdaunant Lead Mining Co., Limited, near Llanidloes.	Aberdaunant	Near Llanidloes	Simon Toy. (No Return.)
2. F. C. Hills & Co., Deptford, S.E., London	Berwyn Phosphorite	Llangynog	D. C. Davies.
3. Sir John Conroy, Bart., Arborfield, Reading, Berkshire.	Cae Conroy	Llanbrynmair	Thos. Owen.
4. John Basil Masefield, Secretary, Ledbury, Herefordshire.	Caelan	Ditto	Jno. Hughes.
5. Central Van Lead Mining Co., near Llanidloes.	Central Van	Near Llanidloes	James Roach.
6. Cwmbyr Mining Co., Limited, Machynlleth	Cwmbyr	Near Machynlleth	N. Bray.
7. Joshua Moss and Co., Llanidloes	Cwm Ricket and Maesnant.	Ditto	Thos. Grenfell.
8. C. Herbert Stokes, Glandovey	Cwm Tudor	Ditto	*C. H. Stokes.* (No Return.)
9. F. Last & Sons, Cyfartha Mine, Penegoes	Cyfartha	Penegoes	N. W. James.
10. East Van Mining Co., Limited, 20, St. Helen's Place, E.C., London.	East Van	Near Llanidloes	Wm. Williams.
11. Glangwden Mine Co., Llanidloes	Glangwden	Ditto	*W. J. Lefeaux.* (Suspended.)
12. C. Herbert Stokes, Glandovey	Glassllyn Consols	Near Machynlleth	*C. H. Stokes.* (No Return.)
13. James Cooper, Secretary pro tem., 3, Coleman Street Buildings, E.C., London.	Glyn	Near Llanidloes	James Roach.
14. Great Dyliffe Lead Mine Co., Llanbrynmair	Great Dyliffe	Llanbrynmair	Ralph Dean.
15. William Taylor, 55, Aldermanbury, E.C., London.	Great Gias	Near Llanidloes	Thomas Grenfell.
16. Geifron and Gwestyn Mine Co., Llanidloes	Gwestyn	Gwestyn	John Kitto.
17. Sir John Conroy, Bart., Arborfield, Reading, Berkshire.	Llanerchyraur	Llanbrynmair	Thomas Owen.
18. Llanidloes Lead Mining Co., Limited, Llanidloes.	Llanidloes	Llanidloes	John Kitto.
19. Joseph Taylor and others, Llanrhaiadr, near Oswestry.	Llanrhaiadr	Llanrhaiadr	E. Pascoe.
20. C. Herbert Stokes, Glandovey	Llechwedd Mawr	Near Plynlimmon	*C. H. Stokes.* (No Return.)
21. Welsh Mineral Co., Limited, Caersws	Llwynybrain	Llwynybrain	Richd. Tilsley. (No Return.)
22. Nantiago Mine Co., Llanidloes	Nantiago	Plynlimmon Mountain.	*W. J. Lefeaux.*
23. New Llangynog Lead Mining Co., 84, Foregate Street, Chester.	New Llangynog	Llangynog, near Oswestry.	James Hill.
24. Penclyn Mine Co., Secretary, J. Jones, Westminster Buildings, Newgate Street, Chester.	Penclyn	Llanidloes	Leigh Howell. (No Return.)
25. G. Girdwood, Edinburgh	Rhoswydol	Ucha Coed	Geo. Green.
26. Snowbrook Silver Lead Mine Co., 84, King William Street, E.C., London.	Snowbrook	Llangurig	Thomas Owen.
27. Van Mining Co., 14A, Austin Friars, E.C., London.	Van	Llanidloes	Wm. Williams.
28. J. J. Stansfield, Secretary pro tem., 10, Birch Lane, Cannon Street, E.C., London.	Van Consols	Ditto	James Roach.
29. C. Herbert Stokes, Glandovey	West Cyfartha	Near Machynlleth	*C. H. Stokes.* (No Return.)
30. West Wye Valley Lead Mining Co., Limited, near Llanidloes.	West Wye Valley	Near Llangurig	J. Kitto.
31. Wye Valley Lead Mining Co., Limited, Llanidloes.	Wye Valley	Ditto	Ditto.
RADNORSHIRE.			
1. New Cwm Elan Mine Co., Cwmdauddwr	New Cwm Elan	Cwmdauddwr	Wm. Goldsworthy. (Abandoned.)
2. St. Harmon Mining Co., Limited, Llanidloes.	St. Harmon's	Near Llanidloes	J. Kitto.
SHROPSHIRE.			
1. Bog Mining Co., 14, Austin Friars, E.C., London.	Bog Mine	Minsterley	Jno. Delbridge.
2. Ladywell Mining Co., Limited, Minsterley	Ladywell	Ladywell, Shelve Parish.	Arthur Waters.

List of Mines in Mr. T. F. Evans' District, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Situation.	Owner or Agent.
Shropshire—*continued.*			
3. Batholes Mining Co., Limited, Minsterley	Old Batholes -	Minsterley -	E. Parry. (No Return.)
4. Pennerley Mining Co., Limited, 14, Austin Friars, E C., London. (*In liquidation.*)	Pennerley -	Ditto - -	Jno. Delbridge.
5. Perkins Beach Mining Co. (*In liquidation.*) Frederick Cape, 61, Cheapside, London, liquidator.	Perkins Beach -	Near Chirbury -	Enoch Parry.
6. Roman Gravels Mining Co., Minsterley, near Shrewsbury.	Roman Gravels -	Parish of Shelve -	Arthur Waters.
7. Rorrington Mining Co., Chirbury -	Rorrington - -	Chirbury - -	Enoch Parry. (No Return.)
8. Snailbeach Mining Co., Limited, Pontesbury, Shrewsbury.	Snailbeach - -	Snailbeach - -	Hy. Dennis.
9. South Roman Gravels Mining Co., Limited, 18, Austin Friars, E.C., London.	South Roman Gravels	Shelve and Shelfield	J. W. Powning.
10. Tankerville Mining Co., Limited, Minsterley.	Tankerville -	Parish of Worthen	A. Waters.
11. West Tankerville Mining Co,, Limited, Minsterley.	West Tankerville -	Ditto - -	Ditto.
12. W. T. Parker, Pool Quay, Welshpool -	Wotherton - -	Chirbury - -	*W. T. Parker.*
13. Wotherton Barytes Mining Co., Chirbury	Wotherton - -	Ditto - -	Enoch Parry.
Isle of Man.			
1. Bell Abbey and Falcon Cliff Mines Co., Limited, Colby.	Bell Abbey and Falcon Cliff.	Rushen - -	W. C. Bew.
2. Central Foxdale Mining Co., Limited, Foxdale, near Douglas.	Central Foxdale -	Parish of Marown	W. T. Harris.
3. Isle of Man Mining Co., Limited, Foxdale	Foxdale - -	Foxdale - -	W. Kitto.
4. Glenroy Mining Co., Limited, Laxey -	Glenroy - -	Parish of Lonan -	R. Rowe. (No Return.)
5. Great East Foxdale Mine Co., Limited, near Douglas.	Great East Foxdale	Kirk Marown -	W. T. Harris.
6. Great Laxey Mine Co., Limited, Laxey -	Great Laxey -	Laxey Glen -	F. Reddicliffe.
7. Great Snaefell Mining Co., Limited, Douglas.	Great Snaefell -	Parish of Lonan -	Jno. Henley.
8. The Manx Silver Lead Mining Co., Limited, 40, North John Street, Liverpool.	Manx - -	East Baldwin	John Crowe.
9. Rushen Mine Co., Colby - - -	Rushen - -	Colby - -	Jno. Barkell.

FIRE SAND MINE.

Carnarvonshire.			
1. Nant-y-Gamer Fire Clay Co., Llandudno -	Nant-y-Gamer -	Near Llandudno -	W. J. Joule.

LIMESTONE MINES.

Denbighshire.			
1. Chirk Castle Lime and Stone Co., Limited, Fron, Llangollen.	Chirk Castle -	Fron Llangollen (Denbigh).	Wm. Roberts.
Shropshire.			
1. Steeraway Lime Co., Steeraway, Wellington, Salop.	Hatch - -	Near Steeraway	James Groome.
2. Lilleshall Limeworks Co., Newport, Salop	Lilleshall - -	Salop.	

IRON ORE MINES.

Flintshire.			
1. E. W. Gee & Co., Denbigh - -	Bodfari Hematite -	Bodfari - -	*E. W. Gee & Co.*
2. B. Anderson & Co., Cwm, St. Asaph -	Cwm Hematite -	Cwm, St. Asaph -	Geo. Harrison.
3. B. Anderson & Co., Newmarket (near Rhyl).	Henfryn Hematite	Newmarket - -	Ditto.

LIST of MINES in MR. T. F. EVANS' DISTRICT, 1878—*continued.*

Owner or Company, and Postal Address.	Name of Mine.	Situation.	Owner or Agent.
SLATE MINES.			
CARNARVONSHIRE.			
1. Bugail Slate Co., Limited, Four Crosses, Festiniog.	Bugail - -	Cwt-y-Bugail Penmachno.	E. Gibson, Secy.
2. O. E. Hughes, Trefriw - - -	Clogwyn-y-Fuwch	Llanrhychwyn -	*O. E. Hughes.*
3. Port Bangor Slate Co., Llanllechid, Bangor	Port Bangor -	Llanllechid - -	Geo. J. White.
4. Festiniog Slate Co., Portmadoc - -	Rhiw-Bach -	Rhiw-Bach, Penmachno.	Jas. S. Tuxford.
MERIONETHSHIRE.			
1. R. D. Pryce, Cyfronydd, near Welshpool -	Aberllefenny -	Near Machynlleth -	David Jones.
2. George Gregory Tremlett, Aberdovey -	Allt Goch - -	Aberdovey - -	Thomas Rees.
3. Thomas Dodd, Vernon Chambers, Vernon Street, Dale Street, Liverpool.	Braich Du -	Maentwrog - -	E. J. Briggs.
4. Braich Goch Slate Quarry Co., Limited, near Machynlleth.	Braich Goch -	Corris, near Machynlleth.	Edwd. Williams, Secretary.
5. Abergynolwyn Slate Co., Limited, Towyn	Bryneglwys -	Llanfihangel-y-Pennant.	E. Evans.
6. Bwlch-y-Slater Slate Co., 36, Eastgate Street, Chester.	Bwlch-y-Slater -	Festiniog - -	Hugh Davies.
7. Carlyle Slate and Slab Co., Limited, Dinas Mawddwy, R.S.O.	Carlyle - -	Minllyn, Dinas Mawddwy.	Thomas Forster.
8. The Conglog Slate and Slab Co., Limited, Tanygrisian.	Conglog - -	Tanygrisian -	John Edwards.
9. Croesor New Slate Co., Limited, Croesor, 10, Bank Place, Portmadoc.	Croesor - -	Croesor - -	Thos. Williams.
10. C. S. C. Crespigny, Secretary, 7, Westminster Chambers, London, S.W.	Crown - -	Dolgelley - -	R. P. Williams.
11. The Cwmorthin Slate Co., Limited, Tanygrisian.	Cwmorthin -	Tanygrisiau - -	Andreas Roberts.
12. H. R. Hughes and Nephew, Cymerau Quarries, Corris, Machynlleth.	Cymerau - -	Talyllyn -	G. F. Smyth.
13. Diphwys Casson Slate Co., Limited, Four Crosses.	Diphwys Casson -	Festiniog - -	E. P. Jones.
14. E. H. Oliver, Kingston, near Arundel, Sussex.	Drum - -	Do. - -	James Davies.
15. Gaewern Slate Quarry Co., Limited, Machynlleth.	Gaewern -	Corris - -	Wm. Hughes.
16. Jno. W. Greaves and Sons, Rhiwbryfdir, R.S.O.	Llechwedd - -	Rhiwbryfdir -	*J. Ernest Greaves.*
17. Maengwynedd, Slate and Slab Co., Llanrhaiadr, Oswestry.	Maengwynedd -	Llanrhaiadr -	W. Thos. Owen.
18. Maenofferen Slate Co., Limited, Four Crosses, Festiniog.	Maenofferen -	Four Crosses -	Wm. Owen.
19. Moelfferna and Deeside Slate Co., Limited, Glydyfrdwy, Llangollen.	Moelfferna and Deeside.	Glydyfrdwy -	Richard Davies.
20. W. E. Oakeley, Rhiwbryfdir, R.S.O. -	Oakeley Upper Quarries.	Rhiwbryfdir -	Rees Roberts.
21. Do. Do. - -	Oakeley Middle Quarries.	Do. - -	Robert Roberts.
22. New Rhosydd Slate Co., Limited, Tanygrisian, via Carnarvon.	New Rhosydd -	Festiniog - -	W. W. Morris.
23. The Welsh Slate Co., Rhiwbryfdir -	Palmerston - -	Rhiwbryfdir -	H. F. Phillips.
24. Pant Mawr Slate and Slab Quarry Co., Limited, South Snowdon Wharf, Portmadoc.	Pant Mawr -	Great Moelwyn Mountain.	Geo. Maxwell.
25. Park Slate and Slab Co., Limited, Penrhyndeudraeth.	Park Slate - -	Llanfrothen -	Wm. Kellow.
26. J. Parry Jones, Denbigh, and E. H. Parry, Penarth, Corwen.	Penarth - -	Corwen - -	*E. H. Phillips.*
27. Rowlands and Hughes, Ratgoed Quarries, Corris, Machynleith.	Ratgoed - -	Talyllyn - -	G. F. Smyth.
28. Union Slate and Slab Co., Tanygrisiau, Festiniog.	Union - -	Great Moelwyn -	*Geo. Potter.*
29. Thomas Mark Carter, West End Park, Harrogate.	Voelgron - -	East of Festiniog -	Griffith Griffiths.
30. Votty and Bowydd Slate Quarries Co., Limited, Four Crosses.	Votty and Bowydd	Festiniog - -	Thos. G. Jenkins.
31. The Wrysgaen Slate Co., Tanygrisiau, via Carnarvon.	Wrysgaen -	Do. - -	*Wm. Davies.*
MONTGOMERYSHIRE.			
1. Brythdir Slate Quarry Co., Llanfyllin -	Brithdir - -	Llanfyllin - -	John Jones.

Dr. C. Le Neve Foster's Report.

REPORT on the INSPECTION of METALLIFEROUS MINES in CORNWALL, DEVONSHIRE, DORSETSHIRE, and part of SOMERSETSHIRE, for the year ended 31st December 1878.—By CLEMENT LE NEVE FOSTER, Esq., B.A., D.Sc., F.G.S.

SIR, Truro, 24th March 1879.

IN accordance with section 20 of the Metalliferous Mines Regulation Act, I have the honour to present you my Annual Report for the year 1878.

ANNUAL RETURNS.

From the annual returns which are given in detail at the end of my report, I have deduced the following summaries :—

PERSONS EMPLOYED IN 1878.

	Cornwall.	Devonshire.	Dorsetshire.	Part of Somersetshire.	Totals.
Underground :—					
Boys of 12 to 13	8	—	1	—	9
Males of 13 to 16	393	32	2	3	430
Males above 16	6,683	645	204	189	7,721
Total underground	7,084	677	207	192	8,160
Above ground :—					
Boys of 8 to 13	339	17	8	9	373
Girls of 8 to 13	69	5	—	—	74
Males of 13 to 18	1,431	168	47	20	1,666
Females of 13 to 18	724	75	—	—	799
Females above 18	1,394	60	—	—	1,454
Males above 18	2,705	597	114	42	3,458
Total above ground	6,662	922	169	71	7,824
Total numbers employed	13,746	1,599	376	263	15,984

Compared with 1877 there is a total diminution of 3,997 persons, of whom 2,168 worked underground and 1,829 at the surface. In Cornwall alone 3,656 fewer persons were employed, which represents a diminution of 21 per cent.

MINERAL DRESSED, and UNDRESSED MINERAL SOLD, TREATED, or USED in 1878.

	Cornwall.	Devonshire.	Dorsetshire.	Part of Somersetshire.	Totals.
	Statute Tons.	Statute Tons.	Statute Tons.	Statute Tons.	Statute Tons.
Arsenic, obtained at mines	1,676 3/20	2,788 11/20	—	—	4,464 14/20
Arsenical pyrites	2,958 3/20	679 19/20	—	—	3,638 2/20
Barytes (sulphate)	—	312 14/20	—	—	312 14/20
Cement stone	—	—	1,924 10/20	—	1,924 10/20
Copper ore	37,144 14/20	12,804 4/20	—	—	49,948 18/20
Copper precipitate	8 12/20	—	—	—	8 12/20
Fluor spar	—	7 7/20	—	—	7 7/20
Iron ore	1,291 10/20	3,493	—	40,115 6/20	44,899 16/20
Iron pyrites	232 18/20	—	—	—	232 18/20
Lead ore (dressed)	1,345 18/20	233 14/20	—	—	1,579 12/20
Manganese ore	144 4/20	1,348	—	—	1,492 4/20
Ochre	70	—	—	—	70
Potter's clay and other clays	—	26,233	34,028	—	60,261
Purbeck stone, dressed	—	—	12,939 10/20	—	12,939 10/20
Purbeck stone, undressed	—	—	1,472	—	1,472
Silver in bars	153 oz.	—	—	—	153 oz.
Silver ore	86 5/20	—	—	—	86 5/20
Silver precipitate	8½ cwt.	—	—	—	8½ cwt.
Slate	364	2,266 10/20	—	—	2,630 10/20
Tamping stone	60	—	—	—	60
Tin ore, dressed (*black tin*)	13,585 3/20	47 7/20	—	—	13,632 10/20

	Cornwall.	Devonshire.	Dorsetshire.	Part of Somersetshire.	Totals.
	Statute Tons.	Statute Tons.	Statute Tons.	Statute Tons.	Statute Tons.
Tin ore, partially dressed (*Whits*, estimated to contain 97¼ tons of *black tin*)	950 9/20	—	—	—	950 9/20
Tin ore, undressed (*Tinstuff*, estimated to contain 490¼ tons of *black tin*)	9,847 17/20	—	—	—	9,847 17/20
Uranium ore	8 cwt.	—	—	—	8 cwt.
Wolfram	10	—	—	—	10
Zinc ore	4,277 3/20	—	—	—	4,277 3/20

Compared with 1877 there is a considerable decrease in the production of arsenical pyrites, and of the ores of copper, iron, lead, and silver, but a decided increase in the case of potter's clay and tin ore. The increased output of tin ore, in spite of the low price, is marvellous, and affords marked proof of the extraordinary vitality of many of the Cornish tin mines. The accompanying table, similar to one I prepared last year, shows how the production has increased as the price has diminished :—

Year.	Total Quantity of *Black Tin* produced at Mines, exclusive of Openworks and the so-called Streamworks.	Average Standard.	
		Common.	Refined.
	Statute Tons.	*s.* *d.*	*s.* *d.*
1875	12,611	82 0	83 6
1876	12,637	72 5	71 5
1877	13,341	65 7	66 7
1878	14,220	56 10	57 10

The lowest standard for common tin during the year was 51*s.*, the highest 63*s.* The continuous drop in the price of tin for the last few years has caused many mines to be abandoned, but the increased output of the larger mines has far more than made up for their deficiencies. Thus Carn Brea Mine produced 157 tons of tin ore more than in 1877, Dolcoath 120 tons, Eliza Consols 168 tons, South Condurrow 240 tons, South Wheal Frances 320 tons, Wheal Peevor 198 tons; in fact these six mines alone produced in 1878 1,203 tons more than they did in the previous 12 months. The most cursory glance at these figures proves that the mineral resources of Cornwall are in nowise exhausted, and that this county is not likely to yield up its position as one of the principal tin-producing districts of the world.

Fatal Accidents.

The number of fatal accidents and deaths in 1878 and the five previous years is shown by the following table :—

	Number of Fatal Accidents.						Number of Deaths resulting therefrom.					
	1873.	1874.	1875.	1876.	1877.	1878.	1873.	1874.	1875.	1876.	1877.	1878.
Falls of ground	10	12	7	6	10	7	10	16	7	7	13	7
In Shafts.												
Overwinding	—	—	—	—	—	—	—	—	—	—	—	—
Ropes and chains breaking	2	—	—	1	—	—	2	—	—	2	—	—
Whilst ascending or descending by machinery.	3	1	—	—	1	1	3	2	—	—	1	1
Falling into shaft from surface.	—	1	—	—	—	—	—	1	—	—	—	—
Things falling from surface	—	—	1	—	—	—	—	—	1	—	—	—
Falling from part way down.	11	11	10	3	3	1	11	11	10	3	3	1
Things falling from part way down.	4	2	4	—	2	—	4	2	4	—	3	—
Miscellaneous in shafts	—	4	1	—	2	2	—	4	1	—	2	2
Total in shafts	20	19	16	4	8	4	20	20	16	5	9	4

	Number of Fatal Accidents.						Number of Deaths resulting therefrom.					
	1873.	1874.	1875.	1876.	1877.	1878	1873.	1874.	1875.	1876.	1877.	1878.
Miscellaneous Underground.												
Explosions of gunpowder, &c.	5	3	4	2	3	3	5	4	4	2	3	4
Suffocation by gases -	1	—	1	—	—	—	1	—	1	—	—	—
Irruptions of water -	—	—	1	—	—	—	—	—	3	—	—	—
Falling into water -	—	—	—	—	—	—	—	—	—	—	—	—
On inclined planes -	—	—	—	—	—	—	—	—	—	—	—	—
By trams and tubs -	—	—	—	—	—	—	—	—	—	—	—	—
By machinery underground.	1	2	—	—	—	—	1	2	—	—	—	—
Sundries underground -	8	2	7	3	3	2	8	2	7	3	3	2
Total miscellaneous	15	7	13	5	6	5	15	8	15	5	6	6
On Surface.												
By machinery on surface	8	3	4	2	1	2	8	3	4	2	1	2
Boilers bursting - -	3	1	—	—	—	1	4	1	—	—	—	1
Miscellaneous on surface	3	2	4	2	1	2	3	3	4	2	1	2
Total on surface -	14	6	8	4	2	5	15	7	8	4	2	5
Gross totals -	59	44	44	19	26	21	60	51	46	21	30	22

The death rate for last year was, with the exception of 1876, the most favourable that has been since the Act came into force. I have tabulated the results as follows :—

Year.	Persons employed.	Number of Deaths by Accident.	Number of Persons employed for one Death by Accident.	Number of Deaths by Accident per 1,000 Persons employed.
1873	30,004	60	500	2·00
1874	25,292	51	496	2·01
1875	22,520	46	489	2·04
1876	21,238	21	1,011	0·98
1877	19,981	30	666	1·50
1878	15,984	22	726	1·37
Totals and Averages	135,019	230	587	1·70

In comparing these figures with similar data obtained from coal mines, we must not forget the large proportion of surface workers in the metalliferous districts, and in order to obtain a fair idea of the relative amount of danger to which coal and metal miners are respectively exposed, this source of error should be eliminated. As there is no accurate record of the number of persons employed in metalliferous mines in 1873, I must begin with the following year.

Year.	Mines of Great Britain and Ireland classed under the Coal Mines Regulation Act.			Mines of Great Britain and Ireland classed under the Metalliferous Mines Regulation Act.			Mines in Cornwall, Devon, Dorset, and part of Somerset, classed under the Metalliferous Mines Regulation Act.		
	Number of Persons employed underground.	Number of Deaths from accidents underground.	Death rate by accidents per 1,000 employed underground.	Number of Persons employed underground.	Number of Deaths from accidents underground.	Death rate by accidents per 1,000 employed underground.	Number of Persons employed underground.	Number of Deaths from accidents underground.	Death rate by accidents per 1,000 employed underground.
1874 -	428,611	947	2·20	34,036	89	2·61	13,316	44	3·30
1875 -	427,047	1,145	2·44	34,905	110	3·15	11,968	38	3·17
1876 -	409,229	822	2·00	34,109	64	1·93	11,085	17	1·54
1877 -	395,025	1,109	2·80	34,095	86	2·52	10,328	28	2·71
1878 -	382,979	1,327	3·46	30,514	69	2·26	8,160	17	2·08
Totals and averages	2,042,861	5,350	2·61	167,659	418	2·49	54,857	144	2·62

The result of this inquiry is somewhat startling and unexpected, for these figures show that, in spite of immunity from explosions of fire-damp, the occupation of a metal miner is almost as dangerous as that of a collier; indeed, as far as my district is concerned, it appears to be a shade more dangerous. No stronger reason than this can be given for the establishment of a permanent relief society in my district, but I greatly regret that the idea does not meet with much favour among the managers of mines in Cornwall.

The usual schedule appended to my report furnishes some particulars of every fatal accident that occurred in 1878, and I will now make a few general remarks, and add some details concerning them.

Falls of Ground.

In six cases out of the seven the falls were certainly unexpected and in several instances the survivors asserted that the ground had been properly *sounded*. In accident No. 12 the ground was known to be a little weak, but as it was on the *foot wall*, the men considered that even if the piece did come away it would simply slide down and do no damage.

Accident No. 19 happened while the man was alone; but after examining the workings and place where he was found, I came to the conclusion that he was most probably injured by an unexpected fall of ground.

Five of the seven accidents happened in stopes, one in a shaft, and one in a level.

With reference to these falls of ground I can merely repeat what I have said year after year, that they can only be prevented by great care and constant vigilance on the part of men and agents, and by the frequent use of timber in places were it may not appear immediately necessary. It is due, however, to the men to say that some of the accidents happened where all ordinary precautions had been used.

In Shafts.

Whilst ascending or descending by Machinery.

W. J. Richards, who was killed at an iron mine on the Brendon Hills, met with his death from wilfully infringing the rules of the mine. Although he would have had to climb only 82 fathoms to the surface, he jumped into the "tram" underground in spite of the warnings of several of the men, and was killed by its tipping over, as he was endeavouring to get out, before it had stopped. The rule forbidding men to ride was posted up in the changing house, and on examining the fine-book I saw that several men had been made to pay a penalty for breaking it. Indeed, two men had been fined only a fortnight before the accident.

Falling from part way down.

Considering the number of men and boys who are climbing long lengths of ladders every day, one fatal accident is not excessive. In fact, I doubt whether one can ever expect to have fewer accidents of this kind than there were in 1878. The exact cause of accident No. 4 was never ascertained. A lad had climbed up the shaft, and when within a few feet of the surface on the top ladder he fell from it on to a platform below, a distance of only 10 or 12 feet, and received fatal injuries.

Miscellaneous in Shafts.

In accident No. 10 a skip was resting as usual upon a "gate," a piece of oak 8 or 10 inches square. The filler stepped upon the skip in order to cross the shaft, and at that moment the gate broke. It appears that the timber gave way where there was a knot, and perhaps the extra weight of the man brought about the fracture. When the skip dropped the slack chain gave a surge and knocked the unfortunate man down the shaft.

Miscellaneous Underground.

Explosions of Gunpowder, &c.

There were three fatal blasting accidents and four deaths.

Accident No. 7 was caused by a hole hanging fire, and then exploding unexpectedly. Two holes were charged with dynamite cartridges and caps in the usual way, and fired. Only one went off. After waiting about half an hour one of the men went back into the level to put in a new fuse and detonator. He could only just have reached the "end" when the charge exploded inflicting fatal injuries upon him.

In some mines there is a very good rule that no one shall return to a hole that has

apparently missed during the remainder of his shift, or at all events not for the lapse of an hour. It is a great pity that this regulation is not enforced universally.

In accident No. 17 a shaftman was in the act of ramming down the second layer of tamping upon naked gunpowder with an iron bar when the charge exploded.

The worst blasting accident, and indeed the most serious casualty of last year, causing the death of two men, occurred at Carn Brea on the 27th September. I happened to be abroad on leave at the time, but I visited the scene of the accident on the 1st October, and on the following day Major Majendie, R.A., H.M. Inspector of Explosives, came down to hold an inquiry under the 66th section of the Explosives Act. As Major Majendie's very exhaustive report has been published, it will not be necessary for me to go so fully into the case as I might otherwise have done; I will merely explain it briefly.

Three holes, which I will call Nos. 1, 2, and 3, charged with dynamite on the afternoon of the 26th September, had been fired at 4 p.m. at the bottom of Highburrow West Shaft, which was being sunk with the aid of two percussive drills, worked by compressed air. Three reports were heard; eight other holes were next charged and blasted half an hour afterwards, and the men occupied themselves with clearing away the "stuff." This work having been accomplished by the morning, boring had to be recommenced, and one of the drills was fixed so as to bore a new hole about 10 inches from the remains of No. 1, of the previous afternoon, which had not "torn" quite to the bottom. The drill, which was clamped to a round bar, was apt to shift its position a little if the bit struck a sloping surface; and from the position in which it was found after the accident, with the bit touching part of the old hole, it was evident that in this case it had shifted considerably. At all events the men had been boring a very short time when an explosion took place, which caused the death of two men, and injured three others.

As dynamite was the only explosive in use in the shaft, and as the results were too great for the mere explosion of a cap, it may fairly be assumed that the accident was caused by the explosion of dynamite, or nitro-glycerine washed out of it.

There are three ways in which the accident may have happened.

1. From loose dynamite lying about.

2. From unexploded dynamite being left in the bottom of the hole, owing to the "collar" having been blown away, with the upper part of the charge, by the explosion of a neighbouring hole fired at the same time.

3. From unexploded dynamite left in the hole due to an imperfect explosion of the charge.

A good deal of care seems to have been exercised in sending down the materials for blasting, and there was no evidence in support of the first hypothesis. Nor does the second, which undoubtedly serves to account for some accidents, appear likely in the present instance. The men had arranged the lengths of fuse so that No. 1 was to go off first, and they were of opinion that No. 2, from its position, could not have blown off the collar of No. 1. No. 3 was still further off. Nothing but the best gutta-percha fuse was employed.

We now come to the third hypothesis, that the top part of the charge exploded, leaving the bottom intact. More than two years ago I was led to the conclusion that partial explosions of dynamite charges occasionally take place, and in my report for 1876 I said, "It cannot be "denied that the whole of the dynamite in a charge does not always go off when a shot is "fired, and some occasionally remains, as a source of danger to the workman, ready to explode "when struck by the pick or borer."

Again, last year, in reporting upon the accident at South Wheal Crofty, I gave it as my opinion that the accident was caused by the "explosion of some remnants of dynamite which did not go off in the original blast." I also suggested the same cause for a non-fatal accident at Wheal Comford.

Recollecting these various cases, it naturally occurred to me that the Carn Brea accident might be satisfactorily explained in a similar manner, and I was glad to find that Major Majendie arrived at the same conclusion quite independently. The causes which may lead to the partial explosion of a charge are fully elucidated in his report. Admitting then that unexploded dynamite remained at the bottom of No. 1 hole, and was left there in contact with water for some 15 hours, it is perfectly allowable to suppose that some nitro-glycerine exuded and exploded when the rock was struck by the violent blows of a powerful machine drill, or indeed the drill may have driven down fragments of rock on to the remnants of the charge. The only means of preventing accidents of this kind is set forth in the recommendation of the jury, who returned a verdict of accidental death at the inquest, "that a strict system of searching for unexploded dynamite be invariably carried out after blasting."

J. Craze, who was in charge of the men shortly before the accident, was to blame for not having made a proper examination of the ground before the new hole was started. He

admitted (and then subsequently denied) that he knew that No. 1 hole had not torn to the bottom. In extenuation of his fault, it is but fair to say that, previous to the ventilation of the question at the Carn Brea inquiry, danger from partial explosions was not so thoroughly recognised as it is now.

Considering the large quantities of dynamite in use for blasting, it is of the greatest importance that all mine agents should impress upon the men two of the dangers connected with this explosive, viz., danger of exudation of nitro-glycerine when the charge is left in contact with water, and danger of occasional partial explosions from imperfect detonation. I am glad to find that Nobel's Explosives Company, Limited, have called attention to this danger by a circular.

Miscellaneous underground.

Accident No. 16 evinced considerable want of proper care on the part of the agents of Dolcoath. A miner was assisting the timberman to haul a piece of timber along an overhanging tram-road constructed across some wide workings; on one side was a wall of rock, and on the other no rail or fence whatever to save a man from a fall of more than 60 feet. The miner happened to slip, fell over, and received injuries that caused his death. The tram-road in question had been in use about five weeks, and an order was given a few days before the accident to put up a wire rope fence. One of the agents admitted that all the dangerous part of the road could have been fenced in 12 hours. There is no doubt that the road ought to have been properly fenced and protected before any regular traffic was allowed on it. Though the Act makes no reference to fences in such places, I had on more than one occasion called the attention of the Dolcoath agents to similar unfenced tram-roads at the sides of underground precipices, and no sensible man could pass along one of these roads without noticing the danger to which men were exposed unnecessarily, for want of a few posts and a little wire rope. At Dolcoath there was not even the excuse of poverty which is so frequently alleged at other mines.

On Surface.

By machinery on surface.

I must confess that I have some doubts whether accident No. 15 ought, strictly speaking, to be included in my list, as it happened after working hours, when the boy was not really being employed by the mining company. After leaving work in the evening at Wheal Grenville, a boy of 11, named William John Barnes, went to play inside a small water-wheel on the dressing floors and make it go round. An older lad named Jenkin, who looked after some of the little boys, hearing that Barnes was in the wheel, sent a boy to tell him to come out and go home. Barnes refused, and Jenkin did not trouble himself any further about the matter. The boy was found some hours afterwards quite dead, strangled between one of the spokes of the wheel and the side of the wheel-pit. The poor little fellow lost his life through his own thoughtlessness, but of course Jenkin, who was in charge, ought to have made the boy go away from his dangerous amusement.

John Pascoe, a lad of 16, who was caught by machinery while oiling a bearing, was not doing his regular work, which consisted in emptying tram waggons; however, it appeared that the oiling was occasionally done by him. The weather was very windy and showery, and he had on a long ragged coat, which was blown against the shafting and twisted up, and the boy was whirled round and killed. He was using an oil can, 14 inches long from the spout to the handle, and could easily have oiled the bearing in safety. However, I must say that where it is reasonably practicable, it is a good plan to stop the machinery at stated times to oil it, for in this way all risk of accidents is avoided, and at the same time there is less likelihood of the oiling being forgotten.

Boiler explosions.

There were two boiler explosions in 1878, one at West Tolgus, which caused the death of the engineman, the other at South Wheal Frances, when happily no one was injured.

The facts of the West Tolgus case are as follows:—

The boiler that exploded was of the usual Cornish type, with a single flue, and internally fired. The length of the boiler was 34 feet 6 inches, the diameter of the case 6 feet 5 inches, and of the flue 3 feet 10 inches. Plates of the flue $\frac{3}{8}$ inch thick; no strengthening rings. The fittings were, one lever safety valve, one steam pressure gauge, one glass water gauge, and two gauge cocks. The boiler that exploded was the middle one of a group of five, and was at the very least 10 years old. The working pressure was 36 lbs.

Steam was shut off at 9 p.m. one evening for the purpose of doing some repairs, and at 4 a.m. on the following morning, as the work was completed, the engineman went to the fires to get up steam, but the pressure had only reached 31 to 32 lbs., it is said, when the explosion took place, scalding the engineman so severely that he died on the following day.

There was a partial collapse of the tube above the fire, the two first plates bulging down considerably and the third very slightly. There was also a great rent along the seam uniting the first and second rings.

It is probable that the explosion was caused by overheating of the plates from shortness of water, though the deceased was very positive on his death-bed that he saw the water at the proper height in the gauge glass. I think that he must have been mistaken, or else that the gauge was choked. There was a special donkey-engine for pumping in feed-water during lengthened stoppages, but it was not put to work on this occasion.

The verdict of the Coroner's jury, after a deliberation of more than two hours, was as follows: "That the deceased was accidentally scalded to death by the explosion of a boiler caused by "shortness of water, and the jury regret that the mining company did not use a fusible "plug which would have prevented the accident in question, and they are of opinion that "the consulting engineer should not have allowed the boiler tube to be subjected to a "pressure of 36 lbs. per square inch, which was half the maximum collapsing pressure of "the tube when perfectly new."

Of course fusible plugs must not be considered as an infallible remedy against boiler explosions; they are only expected to prevent one source of danger, overheating from shortness of water, and they in nowise counteract the great evil of the ordinary Cornish boiler, viz., weakness of the tube. Besides which, like other appliances, they must be watched and kept in good order; but when attended to they form an additional safeguard, and one that has in many cases given timely warning of a deficiency of feed. One of the Boiler Insurance companies shows its appreciation of them by reducing its premiums where certain fusible plugs are used.

I cannot help thinking that the shortness of water may have been caused by one of the other boilers having "robbed" the one that exploded, owing to the back pressure valve having become inoperative from a chip or stone getting under it and preventing it from closing. I found that the feed was brought in 20 inches below the water line, and on questioning the working engineer at the inquest he replied: "We often find one boiler rob "another when we stop. More attention is required when the engine is idle than when we "are working." The consulting engineer in answer to my question also said: "I believe if the feed inlet were higher up the 'robbing' would be less." I am decidedly of opinion that in many of the boilers in my district the feed is brought in too low, causing an additional chance of shortness of water during the stoppage of a group of boilers.

I quite agree with the latter part of the verdict of the jury, for though the inherent weakness of the boiler may not have caused the explosion, it is not right to work any boiler, and especially an old one, with so small a margin of safety.

Miscellaneous on Surface.

With reference to accident No. 2, I may add to my remarks in the schedule that the man was subject to frequent fits, and generally knew when they were coming on and stayed at home. On the day that he was injured he had a slight warning that a fit was impending, and came down from the platform where he was working. The feeling passed off and he went to work again, but he very soon fell down and received injuries to his spine which caused his death.

In accident No. 14 it was clearly proved in evidence at the inquest that the deceased must have known that the hatch was open, as he had passed over it a good many times during the day, and it was his business to have closed it. It is supposed that while pushing his tram waggon over it he tripped and fell through accidentally.

Non-fatal Accidents.

The accompanying table gives a brief account of each non-fatal accident reported to me as causing serious personal injury or arising from any explosion of powder, &c. I must again call particular attention to the fact that this list is probably not a reliable record of all the serious non-fatal accidents, the reason of this being that the word "serious" has two interpretations, *severe* or *attended with danger*. Mine agents frequently adopt the latter interpretation, and do not always report accidents causing a broken limb, because, as they say, the man is in no danger, and consequently the accident is not serious. It appears to me, therefore, that the wording of section 11 is defective, and that the intention of the statute ought

to have been more clearly expressed, as is done in the Factory and Workshop Act. Accidents in factories have to be reported if they are likely to prevent the person injured from returning to his work within 48 hours after the occurrence. I do not mean that the short term of 48 hours need necessarily be adopted under the Metalliferous Mines Regulation Act, but surely the intention of the statute was that accidents severe enough to cause a broken limb should be reported. Conscientious mine agents are, therefore, put to a certain disadvantage by my list, and their mines appear to furnish a larger proportion of the accidents than they would do if all managers sent me reports of all cases similar to those described in the table.

LIST of NON-FATAL ACCIDENTS causing SERIOUS PERSONAL INJURY or arising from EXPLOSIONS OF GAS, POWDER, &c., or any STEAM BOILER, in DR. C. LE NEVE FOSTER'S DISTRICT during the Year 1878.

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.							Miscellaneous underground.						On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878. Jan. 2	1	Carn Brea - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A boy fell 7 feet from the level into the "plot."
„ 5	2	West Basset - -	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	A hole 2 feet 7 inches deep was charged with 4 tonite cartridges and fired. Only the "collar" of the hole, or about 16 inches of it, was blown off. The men searched with a scraper for unexploded tonite, but finding none poured water into the hole and proceeded to bore it deeper; while so doing an explosion occurred injuring the eye of one man and arm of another.
„ 5	3	Wheal Peevor -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	An engineman was moving a winch for changing stamp heads and it fell on his leg and broke it.
„ 17	4	Wheal Uny - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had some of his ribs broken from the fall of some ground which he was in the act of securing with timber.
„ 17	5	West Tolgus -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Piece of lode knocked down stage on which the man was standing and caused him to fall 7 fathoms.
„ 17	6	Ditto - -	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	A loose board was knocked away by the bucket rod and fell on to a man's foot and cut it.
„ 21	7	Carn Brea - -	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man received a blow from the ascending step of the man engine because he stood too near it.
„ 23	8	South Wheal Frances	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Unexpected fall of ground.
„ 24	9	Gunnislake Clitters -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	Man fell into a pass which he was endeavouring to clear.
„ 30	10	Carn Brea - -	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	Man received a blow on the head from a borer dropped out of a sling by his comrade who was descending the same ladder.

List of Non-fatal Accidents—*continued.*

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.							Miscellaneous underground.						On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																					
Jan. 30	11	West Basset	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	Explosion while boring out a charge of tonite in a hole that had missed fire. The men thought the charge had exploded, but they mistook the report of a blast in some adjoining stopes for that of the hole they had fired.
Feb. 4	12	Wheal Uny	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	Man lost the sight of one eye from an explosion while beating the "ground" with the poll of a pick near the bottom of a hole which had been fired with dynamite and had done its duty.
„ 4	13	New Boscundle	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man at the surface let a piece of wood slip and it fell on to the head of one of the shaftmen.
„ 5	14	Botallack	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	Some loose stones from a stull fell on a man.
„ 14	15	Devon Great Consols	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	A man had his shoulder blade broken by fall of a loose stone of ore from a pile near the ladder he was climbing.
„ 18	16	Dolcoath	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	A man had his leg broken by getting in between two tram waggons drawn by a horse which he himself was driving.
„ 19	17	Wheal Friendship	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	A man had his arm crushed while oiling machinery.
„ 20	18	Aller	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	A man, while coming up in the kibble, after having set fire to a hole in the shaft, fell to the bottom and received part of the force of the explosion.
„ 25	19	Tincroft	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	A man had his toes injured by the unexpected explosion of a hole as he came into the stope after some other men who had set fire to it had retired.
„ 27	20	South Molton Consols	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had one of his legs and some ribs broken.
Mar. 4	21	West Chiverton	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	A shaftman lost the sight of one eye by a blow from chain of bucket lift while stepping across the shaft.

List of Non-fatal Accidents—*continued.*

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.					Miscellaneous underground.								On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																					
Mar. 12	22	Carn Brea - -	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A boy who was riding on the man-engine without a light fell 6 fathoms from not noticing that a step was broken off.
„ 13	23	Ditto - -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man slipped off a ladder and fell 4 fathoms; he was carrying an axe in his hand.
„ 13	24	Wheal Kitty -	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	A boy had his leg broken from the skip being drawn up a little as he was taking tools out of it.
„ 13	25	Park of Mines -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	An engineman was caught between a cart and the smith's shop.
„ 15	26	Carn Brea - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A man fell 6 feet from off a stage while "pinching down" a rock and broke his arm.
„ 19	27	Penstruthal - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A stone fell upon a man.
„ 20	28	Brendon Hills -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	Carpenter cut his hand severely with a hatchet while at work.
„ 23	29	Carn Brea - -	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	A young man was severely injured in the throat by a blow from the piston-rod of a boring machine which was driven out when the piston accidentally broke off.
„ 28	30	Phœnix - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his ankle hurt by the fall of a stone.
Apr. 2	31	Levant - -	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	A man had his back injured by a piece of timber, which he had shifted, falling into the winze where he was working.
„ 5	32	Dolcoath - -	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	A boy was pouring some gunpowder into an old leaky can and some of it fell through, caught fire, and burnt his face.
„ 5	33	Carn Brea - -	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	A man slipped and was squeezed between the pump rod and side of the shaft.
„ 17	34	Botallack - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A man had his leg broken by falling a few feet from a spreader on to a pile of "stuff" lying in the level.

List of Non-fatal Accidents—*continued.*

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.							Miscellaneous underground.						On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878. Apr. 27	35	Tincroft - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	A boy had his leg broken by one of the "sweeps" of a round buddle; he ought to have stopped it before going on to the head of it.
May 3	36	Ditto - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A young man had one of the bones of his leg splintered by a stone that fell from a barrow that was being wheeled along in the level 12 feet above him.
„ 8	37	Phœnix - -	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	Two men were injured by the explosion of some gunpowder which they were packing down in a "ragged" hole with an iron scraper.
„	38	Wheal Basset -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his thigh broken by an unexpected fall of ground.
„ 26	39	Wheal Brothers -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man broke the small bone of one of his legs from a fall of 6 fathoms, caused by the giving way of a ladder which he had been told was unsafe.
June 7	40	Brendon Hills -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his leg injured by a fall of ground from the side of a level which he was just going to support by timber.
„ 14	41	Carn Brea - -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A lad fell into a skip pit, injured his arm, and was away from work for several months.
„ 17	42	West Chiverton -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man fell from a ladder while going to his work.
„ 20	43	West Seton - -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	A girl, while "spalling," had her face cut by an explosion, probably caused by loose dynamite accidentally sent up from underground, or remnants of dynamite from imperfect explosion of a charge.
„ 20	44	West Basset - -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man was sitting on or leaning against the top chain of two that fenced a shaft, the chain somehow became unhooked and the man fell down the shaft; luckily he happened to catch the chain fence at the next level and escaped with comparatively a few injuries.

List of Fon-fatal Accidents--*continued.*

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.							Miscellaneous underground.						On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																					
June 20	45	Dolcoath - -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man fell 30 feet from the breaking of an old ladder he was climbing in search of a pitch without the knowledge of the agents.
July 5	46	Wheal Owles -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his thigh broken by a fall of ground after he had knocked out a prop supporting it.
„ 6	47	Brendon Hills -	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	Two men injured by a stull breaking and causing them to fall 8 or 9 feet.
„ 15	48	Eliza Consols -	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	Fall from a ladder while playing when descending to his work.
„ 16	49	West Tolgus - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A miner had his great toe broken by a stone falling on it from the side of a level.
„ 16	50	Penhalls - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	A lander had his leg broken by a blow from the whim rope which had broken.
Aug. 10	51	West Tolgus -	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	A man had his leg and knee cut by a plank which slipped as he was moving it.
„ 17	52	Carn Brea - -	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A lad had the small bone of his leg broken from catching his foot between the step of the man-engine and the "sollar."
„ 21	53	Ditto - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A boy fell into a hopper underground.
23	54	Ditto - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A lad had his arm broken by a small fall of ground.
„ 23	55	Wheal Sisters - -	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	A man was severely injured by an explosion caused by boring out a hole charged with powder that had missed fire.
„ 29	56	Wheal Owles -	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	A man had his ankle crushed by an underground "bob" while ascending a shaft where he had no business. He was a stranger to that part of the mine, and was following his comrade who ought to have taken him by the regular travelling road.

List of Non-fatal Accidents—*continued.*

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.							Miscellaneous underground.						On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																					
Aug. 29	57	Carn Brea	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Foot cut by the fall of a rock while "pinching" it out.
Sept. 5	58	Wheal Uny	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	A lander had his mouth cut and some teeth knocked out by a blow from a rail while taking it out of the skip.
„ 5	59	West Seton	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A miner broke two ribs and his collar-bone by falling down a "pass," into which he had just been wheeling some stuff.
„ 6	60	Ditto	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his leg broken by a fall of rock immediately after a blast, which knocked him over the stull.
„ 11	61	Carn Brea	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man fell 12 feet from a pump on which he was standing and cut his head.
„ 12	62	Dolcoath	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A man fell 30 feet from a level into some old workings while assisting to make a proper "travelling road."
„ 18	63	Phœnix	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man fell 30 fathoms down an inclined shaft while endeavouring to cross it at a level.
„ 23	64	Dolcoath	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A man had his head cut and body bruised by falling from one level to another.
„ 24	65	West Chiverton	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A trammer had his leg severely cut by a stone that fell from a stull.
„	66	Wheal Peevor	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	A man fell 3 fathoms in the shaft as he stepped off the ladder by mistake before reaching the sollar.
Oct. 19	67	Wheal Coates	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	A man had his arm broken by a blow from a winch handle.
„ 23	68	Carn Brea	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Some ground burst off and knocked a man over the stope.
„ 29	69	Ditto	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	A man had his face burnt by the unexpected explosion of a hole which it was thought had missed fire.

List of Non-fatal Accidents—*continued.*

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.							Miscellaneous underground.						On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																					
Nov. 1	70	Marke Valley -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A man had his ankle injured by falling 3 fathoms from a level owing to the breakage of a plank which he was crossing.
„ 4	71	Wheal Brothers -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	A man slipped and fell while working at the surface, and broke his leg.
„ 6	72	Tincroft - -	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	A young man slipped while drawing a tram waggon, fell, and had the small bone of his leg broken by one of the wheels.
„ 16	73	Phœnix - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	A lander, while tipping a waggon, was caught by it and knocked over.
„ 18	74	Carn Brea - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A man had a small bone of his hand broken by a piece of timber being rolled on to it accidentally.
„ 20	75	Ditto - -	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	Two young men were seriously injured by an explosion of dynamite, which was not known to be left in the bottom of an old hole.
„ 20	76	South Wheal Frances	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	A lad received injuries to his mouth and teeth by a blow from the handle of a brake used in working an inclined plane.
„ 26	77	Levant - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A boy received injuries to his skull from a stone which fell from a "pass" which he was "running."
„ 28	78	Brendon Hills -	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Two men had their legs injured by a fall of ground from the side of a level.
Dec. 13	79	Carn Brea - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A man received a severe shake and bruises by falling from a ladder in some stopes.
„ 13	80	Ditto - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his head cut by a small unexpected fall of ground.
„ 14	81	Botallack - -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	A lad was severely bruised and had some teeth knocked out by falling down a hole, into which he had just tipped a barrow of "stuff."

Date.	No. of Accident.	Name of Mine.	Falls of Ground.	In Shafts.								Miscellaneous underground.						On Surface.			Gross Total.	Remarks.
				Overwinding.	Whilst ascending or descending by Machinery.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder, &c.	On Inclined Planes.	By Trams and Tubs.	By Machinery underground.	Sundries underground.	Total Miscellaneous underground.	By Machinery on Surface.	Miscellaneous on Surface.	Total on Surface.		
1878.																						
Dec. 17	82	Kingston - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his back injured by a small fall of ground from going back to his working place immediately after a blast.
„ 17	83	West Seton - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man received severe injuries to his back and kidneys from the fall of a rock, which he was in the act of taking down, knowing it to be loose.
„ 17	84	Carn Brea - -	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his nose broken from being drawn up against the poppet heads while ascending in the skip against orders, and after having been fined previously for a similar offence.
„ 18	85	Wheal Peevor -	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	A filler had his leg broken by a stone tipped into the plat rolling against it.
„ 18	86	South Condurrow -	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	A young man received injuries to his side from the explosion of a hole which hung fire a little.
„ 19	87	Brendon Hills -	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	Part of the timber supporting a pass gave way, and a man fell down with the stuff, injuring his leg.
„ 20	88	Dolcoath - -	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	A man had his skull slightly fractured by a stone from a blast, as he had not retired to a place of safety.
„ 23	89	East Pool - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his arm badly cut from ground "bursting" in his stope, and knocking him off the stage on which he was standing.
„ 30	90	Devon Great Consols	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	A locomotive driver had his arm broken while attending to his engine, which was slowly in motion.
„ 30	91	Ditto - -	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	A man injured his arms while lifting a stuffing box.
„ 30	92	Carn Brea - -	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A man had his leg injured by a small fall of ground.
		Totals -	24	1	3	1	10	5	4	24	15	–	1	3	20	39	4	9	13	100	

	Total Accidents.	Total Persons Injured.
Falls of ground -	- 20	24
In shafts -	- 24	24
Miscellaneous underground	- 35	39
On surface - -	- 13	13
	92	100

A brief perusal of this list is sufficient to show that a large proportion of the accidents arise from falls of ground, or are in some way connected with blasting operations.

The blasting accidents were less numerous than in the three preceding years.

Three of them were caused by men not retiring to safe places, or accidentally getting in the way of a blast.

The other 10 may be classified according to the explosive as follows:—

Gunpowder	4
Dynamite	4
Tonite	2

Non-fatal accident No. 12, due to the imperfect explosion of a charge of dynamite and subsequent firing of the remnants by a blow, resembled fatal accident No. 18 in its nature, but happily was not so serious in its result.

No. 75 was a very disastrous accident for two lads. They had been sitting down near the bottom of the shaft waiting for the skip, when one of them got up and said he would bore a little to keep himself warm; so he took up a borer and drove it with a mallet into an old "socket" full of loose gravel. He then took the tamping bar, put it into the hole and struck it down with the mallet in order to fix it so as to hold up the end of a plank and make a seat. On striking the third blow an explosion took place which threw up all the gravel out of the hole, blinding both his eyes and one eye of his comrade.

The occurrence was a strange one and I was for some time puzzled how to account for it. Three explanations could be suggested as in fatal accident No. 18.

1. A loose dynamite cartridge or cap accidentally left in the hole.

2. Unexploded dynamite left by a neighbouring hole having carried away the top of the charge.

3. Unexploded remnants of dynamite left after a partial explosion of a charge.

As it happened, this particular hole had been fired under the immediate superintendence of one of the agents and I was thus able to get full particulars about it. It had been bored and blasted about eight months previously, the charge being nearly a pound of dynamite. The hole did not "tear" to the bottom, but left a socket about 9 inches deep and 3 or 4 inches in diameter, the top of which was about 10 inches above the bottom of the level. Another hole was fired at the same time, but at much too great a distance to have blown off the collar of the one in question. This evidence disposed of the second hypothesis. The agent further informed me that he had examined the socket after the blast and saw no remains of the explosive in it. In addition to this the socket had been under water several times, altogether for a period of six weeks, and on the last occasion two days before the accident. This of course would not destroy the dynamite and indeed might render it more dangerous by causing a separation of the nitro-glycerine from the other component, the *Kieselguhr* or infusorial earth. On questioning the lads at the Redruth Hospital I found that on several occasions they themselves had cleaned out the socket, and one of them had used it as a convenient place to keep his watch while he was actually at work. It would be strange if any dynamite which was not even visible immediately after the blast could have been left after these successive cleanings, and I did not see any cavities in the sides of the socket where it might have lain and escaped detection. The balance of evidence was certainly against No. 3 theory.

There were several facts on the other hand to support the supposition that the explosion might have been caused by dynamite accidentally left in the hole.

In the first place, I found that similar old sockets within a few feet of the one that did the mischief were regularly used as receptacles for various articles, such as candles and nails for instance. Then the part of the level by the side of the socket was constantly being used as a place where pieces of rock too large to go into the skip were broken up by means of dynamite. It is not the least unlikely that a man might have deposited in the socket an extra dynamite cartridge or primer for which he had no use at the moment. We may then suppose that the socket became accidentally filled with a little gravel, as it constantly did from being so near the bottom of the level, and the dynamite remained forgotten.

I had a dynamite primer with cap and fuse inserted into the socket, some loose gravel was then thrown in and the charge fired. It just blew out the gravel with a report about as loud as that which was heard by the bystanders at the time of the accident, but caused rather less smok. From the loudness of the report, force of the explosion, and amount of smoke I thinkthere must have been something more than a cap originally, and I consider the hypothesis of the forgotten primer or cartridge the most probable explanation of the accident.

I may further remark that I constantly have to make complaints of dynamite not being taken into the mines in a proper case or canister, and neglect of this precaution, plainly enjoined by the Act, may have contributed to this accident and perhaps to No. 43.

The man who was injured at Wheal Sisters (No. 55) while unramming a charge that had

missed fire was committing a distinct breach of the law. I explained to the owners of the mine that they would not be taking all reasonable means to prevent such accidents for the future unless they prosecuted the offender. This they promised to do. However the injuries were more serious than appeared at first sight, and the idea of prosecution was dropped, because it was considered that the lesson had been too severe a one already.

Non-fatal accident No. 63 would have been prevented by a proper fence as required by the general rules, and as I had frequently had to make complaints of great negligence at Phœnix Mine, I asked your permission to take legal proceedings against the agent. He was convicted and fined as will be seen under the head of prosecutions.

Before proceeding to this subject I will say a few words about a boiler explosion at South Wheal Frances, which happened on the night of the 27th November.

The pumping engine is worked by a group of three boilers; the engine was stopped for about three-quarters of an hour, and just as it was going to be put to work again a very violent explosion occurred knocking down part of the engine-house, but fortunately without doing any injury to life or limb. The boiler was of the usual Cornish type, internally fired. The shell was 35 feet 7 inches long, 6 feet 6 inches in diameter, and constructed originally of $\frac{1}{2}$-inch plates. These had been thinned by internal corrosion along the water line to $\frac{1}{4}$ inch, $\frac{3}{16}$ inch, and even less, and a great rent 8 feet long was made here parallel to the axis of the shell which burst open. The condition of the boiler was well known to the manager as it had been frequently patched; in fact there was a long row of seven patches just under the rent. I could not ascertain the exact age of the boiler, all that the manager knew was that it had been worked since 1872 at least. In 1875, owing to constant leaks caused by corrosive feed water pumped from underground, a supply of fresh water was brought into the mine at considerable expense for feeding the boilers, and after that no further patches had to be put on and all difficulties ceased. But, in spite of this fact, I cannot help stating that the manager was to blame for working a boiler in such a condition, and had the explosion been attended with fatal results I believe a jury would have been justified in bringing in a verdict of manslaughter against him.

While discussing this topic I may mention that during the year I inspected the fittings of about 300 boilers, and though I still have many faults to find, yet there is a marked improvement compared with what they were for the first year or two after the passing of the Act. In those days steam-gauges and glass water-gauges were rarely seen, but now it is the exception not to find them.

The principal defects I noted were:—

	No. of Boilers in which the defect existed.
Extra weights, such as bricks, pieces of iron, &c., attached to the levers of safety valves	19
No water-gauge besides gauge cocks	1
Leaks interfering with the proper working of water-gauges	14
Water-gauges broken or not acting	9
No steam pressure-gauge	5
Steam pressure-gauge very inaccurate	6

I should add that in the four cases where there were no pressure-gauges the other boilers of the groups were provided with them; in the fifth case the gauge had been removed to be repaired. Some mine agents consider that I have no right to complain of a glass water gauge when it is simply leaking, because they contend that it nevertheless does indicate the height of the water in the boiler. I frequently discover, however, in the case of a leak that the blow-off pipe of the gauge is plugged with wood, and consequently there is a little inconvenience in trying the gauge. Where any such difficulty exists the engineman is apt to neglect this necessary operation, and that is the reason why I complain that these leaky gauges are not "proper" ones under the Act.

Where boilers are worked singly I have no means of ascertaining the correctness or not of the steam pressure-gauges, and I do not consider that it was ever intended by the Act that the Inspector of Mines should take upon himself the duty of testing them. If, however, in a group of two or more boilers I see that there is a discrepancy of 8 or 10 lbs. in the indications I call the manager's attention to the fact, and request him to remedy the defect. When the variation does not exceed 2 or 3 lbs. I naturally let it pass.

Prosecutions.

I regret to record that I had to institute no less than 23 prosecutions last year, each case often included several breaches of the Act; but as long as I meet with such negligence and stupidity as prevailed last year, I shall be obliged to go on constantly asking your permission to take legal proceedings.

As considerable inconvenience arises from delays in sending in the Annual Returns, I begged your leave to prosecute in six cases for infringements of the amended Act, which imposes the obligation of sending in the Annual Return on or before the 1st February each year. In every instance the proper form had been sent to the offender early in January with a circular calling his attention to his liability to be prosecuted if he failed to obey the law.

I obtained five convictions as follows:

Name of Mine.	Name of Person or Company prosecuted.	Fine.
		£ s. d.
Cockknowle - -	Samuel Harrison, owner - -	10 0 0
Creegbrawse - - -	Samuel Bailey, agent - -	1 0 0
Exford - - -	The Exford Iron Ore Company, Limited, owner.	2 0 0
New Consols - -	The New Consols Silver and Arsenic Works, Limited, owner.	1 0 0
Newton St. Cyres -	Messrs. Sims Brothers, owners -	5 0 0
		19 0 0

The case against the agent of South Roskear mine was dismissed, as the magistrates were of opinion that the defendant had taken reasonable means to comply with the Act. It appeared that he put off filling up his return until the 1st February, the very last day, and gave it to one of his men who forgot to post it.

For neglect to fence shafts in mines that were apparently abandoned or discontinued I received your sanction to prosecute in seven cases as follows:—

Name of Mine.	Name of Person or Company prosecuted.	Number of Shafts.	Fine.
			£ s. d.
Arthur, Wheal -	Wm. Skewis and Moses Bawden, owners.	5	2 10 0
Arthur, Wheal -	William Skewis, owner -	3	6 0 0
Arthur, Wheal -	William Skewis, owner -	2	1 0 0
Hermon, Wheal -	Douglass Round and the Rev. Baron Hichens as persons interested in the minerals.	10	Case dismissed.
Hermon, Wheal -	Richard Boyns and James Bennetts, owners.	10	Case adjourned.
Nancegollan - -	W. P. Jewell, person interested in the minerals.	1	0 10 0
Whiteworks -	The New Whiteworks Mining Company, Limited, owner.	2	4 0 0
			13 10 0

I will refer again to these prosecutions under the head of Unfenced Shafts.

The other prosecutions, 10 in number, related to mines that were being worked and were instituted for various breaches of sections 19 and 23 as shown by the table.

Name of Mine.	Name of Person or Company prosecuted.	Section of the Act infringed.	Fine.
			£ s. d.
Coates, Wheal -	The Wheal Coates Tin Mining Company, Limited, owner.	Sec. 23 (6)	0 2 6
Fountains - -	Messrs. Watts, Blake, and Bearne, owners.	Sec. 23 (1)	1 0 0
Killifreth - -	John Michell and Joseph Paull, agents.	Sec. 6	1 0 0
		Sec. 19	1 0 0
		Sec. 23 (7)	1 0 0
		Sec. 23 (15)	5 0 0
		Sec. 28	1 0 0
Kingsteignton Clay Mines.	Browne, Goddard, and Hatherley, owners.	Sec. 23 (1)	1 0 0
		Sec. 23 (7)	Case dismissed.
Kingsteignton Clay Mines.	Whiteway and Mortimer, owners.	Sec. 23 (1)	1 0 0
Netherexe Pit -	Watts, Blake, and Bearne, owners.	Sec. 23 (7)	Case dismissed.
Okel Tor - -	John V. Bennett, agent -	Sec. 19	1 0 0
		Sec. 23 (18)	5 0 0
Phœnix - -	John Truscott, agent - - -	Sec. 23 (7)	7 10 0
		Sec. 23 (9)	7 10 0
Roskear, West -	Hugh Stephens, agent -	Sec. 19	0 10 0
		Sec. 23 (1)	1 0 0
		Sec. 23 (7)	1 0 0
		Sec. 23 (16)	2 0 0
Trevaunance -	G. Coulter Hancock, agent -	Sec. 23 (7)	0 2 6
			37 15 0

The want of ventilation at the clay mines owned by Messrs. Watts and Company, Messrs. Browne and Company, and Messrs. Whiteway and Mortimer, as well as at West Roskear, was simply disgraceful. I found that in various places in each of these mines a candle went out entirely when standing upright, and could only be kept alight by being held in a horizontal position. I may add that I had prosecuted Messrs. Watts, Blake, and Bearne, for a similar offence at one of their clay mines in 1877, when they were convicted and fined.

The agents of Wheal Coates, Killifreth, Okel Tor, and West Roskear (save in the case of the breach of sub-section 1, section 23) had all received notice in writing of the offences against the Act, and were not prosecuted until I found on a second visit that proper attention had not been paid to my letters.

The agent of West Roskear could not have said he was hardly treated if the fines had been very much heavier, for his neglect was very gross. On the 7th September 1877 I gave him notice in writing to provide a proper changing house and keep up the section of the workings. On the 18th December of the same year I again went to West Roskear and found that my notice had not been attended to. On the 26th January 1878 I repeated my visit and had to complain of the same offences. Finally, on the 13th August, finding that the breaches of the Act were still going on, I asked your permission to prosecute, and if the magistrates had not been loath to throw cold water on mining enterprises in these times of depression I believe Mr. Stephens would have been much more severely punished.

Two cases of neglect to fence working shafts at the surface were dismissed by the magistrates on the grounds that the owners had done all that was necessary, and that the neglect rested with the men and not with the masters.

Unfenced Shafts at Abandoned or Discontinued Mines.

I hoped that eight prosecutions and the infliction of fines amounting to 61*l.* 10*s.* in 1877 would have had the effect of causing owners of mineral property to be a little more active in attending to the requirements of section 13; but in this I have been disappointed. Year after year I have to repeat the same story that a very large proportion of my time is taken up by visiting unfenced shafts at abandoned mines. Now that the public are fully alive to the fact that it is the duty of the inspector to see that old shafts are fenced, I am constantly receiving complaints from all quarters.

It is very disheartening after six years hard work to find that the task is not nearly accomplished; but then it must be remembered that I have to deal with the accumulated neglect of centuries. In former times the mineral stewards of the different owners of property seem to have taken little or no trouble to see that the clauses in the leases with reference to fencing

shafts on abandonment were properly carried out. Besides, new cases are cropping up every day, as fences are destroyed and timber coverings give way and expose shafts that were forgotten or unknown.

I fear that there will always be much work of this kind for the inspector of mines in Cornwall owing to the wording of section 13 which simply says that the shafts are "to be and be kept securely fenced" without specifying any mode of fencing or height of fence. The consequence is that I am obliged to pass wooden fences which I feel convinced will not stand for many years and perhaps not for many months. These fences are secure enough for a short time, but are likely to be pulled down by thievish inhabitants of the neighbourhood in want of firewood. I believe the only way to stop the practice of putting up fences of this kind will be to prosecute rigorously any "lords" or lessees of mines, whenever I find their shafts in a dangerous state from the removal of parts of wooden fences. If they are foolish enough to adopt temporary appliances they must take the risk of being fined.

The so-called "hedge" built of dry stone affords better protection than the wooden fence, though it is not entirely satisfactory, for boys delight in tipping over the stones to hear them rattle down the shaft, the hedge gradually loses row after row of its stones and at last fails altogether to fulfil its original purpose.

I have persistently set my face against that kind of fence which has long been a favourite in Cornwall, viz., the timber "sollar." It consists in constructing a strong platform of timber across the shaft a few feet or a few fathoms below the surface and filling up with earth. A shaft with a timber sollar is a mere trap, the timber is sure to give way unexpectedly sooner or later, and this plan merely hides the danger without affording adequate protection against it. The consequence is that whenever I find that a shaft has been sollared with timber I give the responsible person notice to put a fence around it as well.

A sollar made of granite posts will do for a small shaft if properly put in, but the danger is that, unless the supervision during the work has been thorough and complete, you have no guarantee for the security of the structure which is hidden and cannot be examined. I need only recall a case mentioned in my report for 1874. A man who had taken a contract to put in granite posts across an old shaft near St. Ives, was killed by the giving way of his sollar, which did not even stand till he had completed the job.

A strong stone arch built across the shaft where the sides are composed of firm rock is better than the granite sollar; but here again there is the danger of the work being carelessly or inefficiently carried out, and when once buried under several fathoms of earth it is not easy to examine it; where arching or sollaring with granite has been resorted to a stone post should be erected to show the exact position of the shaft.

In St. Just the tops or collars of the shafts are frequently secured by a lining of stone work, and in such cases I have allowed persons to fence them by simply covering them with very large granite posts, too big to be moved without great difficulty. The chinks between the stones show that a shaft exists, and provided that the covering is kept high enough to prevent its being overgrown it seems to me very effective.

Hundreds of shafts have been filled up entirely; but where there is a reasonable probability that they may be required again in years to come this plan is of course unadvisable. In such a case a very efficient way of securing a shaft for future use, and of preventing danger to the public, is to put in an arch at the adit level, and surround the top by a good wall, properly built with stone and mortar, not less than 6 feet high. The only objection to this is the expense and the waste of money that would be caused by building a permanent fence when an abandonment only lasted a year or two. Still, in many instances, I am sure it would be cheaper in the end to do the work strongly and solidly at once than to have a constant expense of repairs.

I will now say a few words with reference to the prosecutions I instituted with your sanction under section 13.

Wheal Arthur.—I have never met with a case of more stupid obstinacy than was exhibited by Mr. William Skewis, one of the lessees of Wheal Arthur. Numerous written notices were disregarded, and I had to summon him three times before I could get certain shafts fenced. When the last summons came on for hearing the work was completed, so I did not then press for a heavy penalty.

Wheal Hermon.—The shafts at Wheal Hermon, in the parish of St. Just, have given me a great deal of trouble. In November 1877 I received a complaint concerning them, and I wrote to a Mr. John Chenhalls, who recently was both owner and agent of the mine, and gave him notice to fence them. He replied that he was no longer lessee, but was simply steward for one of the landowners, and referred me to the existing lessees. I then informed him that under section 13 the lords could make the lessees do the work, by threatening to sue them for the cost of any fences they, the lessors, put up, and I also told him that I should have to

prosecute both lords and lessees unless the shafts were fenced. Not hearing anything more from Mr. Chenhalls I concluded that he was doing the work. On the 6th of August, however, I received a complaint that nothing had been done, and on the 9th I visited Wheal Hermon. I then discovered no less than 54 shafts mostly in uninclosed land, many close to footpaths and highly dangerous. I at once gave formal notice to the lessees, Messrs. Richard Boyns and James Bennetts, and also to one of the lords, Mr. Douglass Round, one of the trustees under the will of the late Rev. Richard Hichens, who had owned the land and minerals of Wheal Hermon.

On the 24th August a man was out with his children gathering blackberries, and accidentally stepped into one of the shafts which was hidden by a covering of brambles. He fell 50 feet, and received a severe concussion of the spine, from which I believe he has scarcely yet entirely recovered. The shaft was in waste uninclosed land within a dozen yards of a road and was one of those named in my notice of the 10th August.

After this accident it seemed to me that this case could hardly be passed over in silence. I had so often prosecuted where no accident had happened that it would have been most unfair not to have taken proceedings in this case, especially as I considered that there was great blame on the part of the lords, through the wilful neglect of their steward, Mr. John Chenhalls. The culpability of the lessees appeared to me to be decidedly less; for they informed me that from conversations they had had with Mr. John Chenhalls, both on taking the lease, and subsequently in March 1878, when they visited the shafts in his company, they had been plainly led to believe that Mr. Round would fence them.

I laid all these facts before you and received your instructions to prosecute both the two lessees and Mr. Douglass Round and the Rev. Baron Hichens, trustees of the property, for neglecting to fence the shafts.

The cases cam eon at the Penzance Petty Sessionson the 6th November. The magistrates dismissed the case against Mr. Douglass Round and the Rev. Baron Hichens onthe ground that the working of the mine was not discontinued, and even if it had been, as the grant or lease was still subsisting, they had no power to convict them.

The facts relating to the discontinuance were simply these. The lessees had ceased all work underground in the mine for many months, and had confined their operations to digging away sand and gravel lying at the surface, and stamping and washing it to extract tin ore. These operations were carried on within the limits of the "sett," but at some distance from the shafts. None of the pits exceeded 5 feet in depth and were wholly exposed to the light of day. *Per se* such workings would not legally be a *mine*, and my contention was that the mine was therefore discontinued.

With your permission I asked for a case, which was argued in the Court of Common Pleas a fortnight ago. My appeal was dismissed on the ground that there was no discontinuance, and that even if there had been the respondents were not "persons interested in the minerals."

My solicitors have drawn up the following brief abstract of the case: "The grounds upon " which the Court dismissed the appeal seem to have been that so far as regards the question " whether there was a discontinuance, of the working of the mine within the meaning of " section 13 of the Metalliferous Mines Regulation Act, the evidence before the magistrates " was sufficient to justify them in deciding that as a matter of fact there was no discon- " tinuance.

" Lord Justice Bramwell, after stating what he considered to be the intention of section 13, " went on to say as follows: 'If one looks at the interpretation clause, it is impossible to " 'say that there was a discontinuance, because the word *mine* includes *every shaft and all* " '*planes, works, tramways, machinery, sidings,* and so forth, things *above* ground as well as " 'underground.'

" As regards the question whether the respondents were persons interested in the minerals " within the meaning of the Act, the Court having dismissed the appeal on other grounds, " did not consider it necessary to give a final determination.

" Lord Justice Bramwell, nevertheless, went into the question at some length and stated " that if the case turned upon it, he should hold that the respondents were not the persons " interested in the minerals, but that the persons working or having a license to work the " mine would be the persons so interested within the meaning of the Act.

" Mr. Justice Lopes, in the remarks which he made on this question, concurred in what " Lord Justice Bramwell had said, and, independently of that, he considered the circum- " stances of the case of Evans *v.* Mostyn distinguishable from this, inasmuch as there there " was a lien on the royalties and a power of re-entry which there was not here, and he " thought that that case might have been decided on those grounds."

The case against the lessees of Wheal Hermon was adjourned until after the hearing of the appeal, and I have now withdrawn the summons as it was taken out under section 13.

Nancegollan Mine.—I sent notice in writing to the defendant on the 28th November 1877 to fence a certain shaft close to his own house, and on visiting the mine some six weeks afterwards I found that the necessary work was not even begun.

Whiteworks Mine.—On the 2nd August 1877, I sent the company notice in writing to fence 15 shafts which were distinctly described in my letter. After the lapse of more than 10 months I found that two were still unfenced.

It is annoying that in many cases I have no power to summon the person who is the greatest culprit, viz., the mineral steward of the "lord." I believe that the landowners in Cornwall, though grudging the expense they are put to, which is trifling however compared to the large sums received by them, or their ancestors as dues, are not unwilling to obey the law; but their "tollers," or mineral agents, are frequently most dilatory and consequently get into disgrace when their employers are summoned for their neglect. The mineral agents then come to me with all sorts of excuses, begging me not to take proceedings against the "lords," and when they find that I do not shrink from an unpleasant duty they sometimes tell me that I am making myself most unpopular. No doubt frequent prosecutions do not tend to render me very agreeable to some of the owners of mineral property in this county; but when I look back and consider the numberless cases where I have refrained from prosecuting I am astonished at my own forbearance; and if I have erred it certainly has not been on the side of harshness.

The necessity of prosecutions is proved by the difficulties I still have to contend with when trying to make people fence their shafts. If I had made no examples during the last six years these difficulties would be far greater than they are now. During the past year I consider that fully one-third of my time was taken up by attending to unfenced shafts at abandoned mines, and the mere cost of a journey to a mine is sometimes more than the expense of fencing two or three shafts. Such a state of things is absurd, and I am determined with your permission to put a stop to it, as far as lies in my power, by a more rigorous system of prosecutions than I have hitherto resorted to.

In spite of the number of dangerous unfenced shafts, it is curious that the only accident to human life last year should have happened with one that was properly protected. Two little boys, aged respectively 12 and 9, climbed over the stone hedge 4 or 5 feet high, round a shaft at Excelsior Mine; the elder pulled out some of the timber at the sides, and began digging up big stones with a shovel and pushing them into the shaft. While so doing the sides slipped in, carrying with them the poor little fellow, who fell a victim to his boylike thoughtlessness. The shaft was on land rented by the father, and the boy had frequently been warned by his parents not to go near it.

New General Instructions.

I had the honour to receive your New General Instructions in June last and I have endeavoured to carry them out to the best of my ability.

In accordance with your directions I have visited mines on receiving complaints whether anonymous or not. Those relating to working mines have been few, but notices of dangerous unfenced shafts were very numerous. The complaints in nearly all cases were well founded. Of course many inspections have been made for the purpose of inquiring into accidents, and in addition I have made frequent casual visits without giving any notice whatever. This indeed has been my practice ever since my appointment, and the agents in my district are fully alive to the fact that they are liable to visits from me without any warning whatever, and, as a rule, do not make any complaints on this account. Messrs. Watts, Blake, and Bearne, however, once said that they thought I had shown a want of courtesy in not calling at their office to tell them I was going to visit their mines; but had I done so the men might have been withdrawn from the badly ventilated places, and the owners would possibly have escaped prosecution. It is probable also that if the agent of West Roskear had received notice of the day of my coming, he would have put his mine in better order. I not unfrequently discover that if my visit was expected, sudden diligence has been displayed in posting up the abstract, writing out the register, and putting up fences underground, whilst the newly sawn ends of the timber have been daubed with mud, to prevent my noticing how recently the work has been done.

I have always kept a record of my visits to mines, and have carefully noted the various breaches of the law which have come under my observation. In many cases in addition to verbal warnings I have given the owner or agent notice in writing to remedy the offences without delay. I find that I sent 219 notices in writing, of which two-thirds referred to unfenced shafts at abandoned mines.

I made 203 visits to working mines, and 128 to abandoned mines with reference to the fencing of 547 shafts.

I did not find it necessary to give any formal notice under section 18 concerning dangerous practices; I have occasionally called attention to cases of obvious danger, about which no difference of opinion could exist, as explained in your instructions, and the agents have generally been ready to attend to my suggestions.

Twenty-two inquests were held in my district in cases of mine accidents, and I attended all but two, which took place during my absence on leave. I was also present at the inquiry by the Coroner concerning the death of the boy who was killed by falling into the shaft at Excelsior Mine. I find that the coroners are always glad to have my assistance.

I have already given a list of the prosecutions which I instituted with your sanction, and I attended 13 petty sessions at which the summonses were heard.

In accordance with instruction No. 9 I duly forwarded to you the Annual Returns as soon as they had been embodied in my report, so that they might be deposited at the office of the Keeper of Mining Records.

Various plans of abandoned mines have been sent to me from the Home Office, and I have duly reported upon them. I frequently call the attention of mine owners to the obligations imposed upon them by section 14, for I believe that if I did not do so very few plans would be sent up to you from my district.

On receiving the notice of an accident from gunpowder or any other explosive I have sent a copy of it to you as soon as possible.

Your instructions as to the Education Act reached me in July last, and as I then learnt that the duty of enforcing regulations with regard to the manner in which children could be employed *above ground* would on the 1st January 1879 devolve upon the Inspector of Factories, I thought it was hardly worth while trying to introduce new rules at the dressing floors which would be superseded at the end of a few months. I have, however, called the attention of managers of mines by a circular to the restrictions imposed by the Education Act with regard to the employment of boys *underground*, and I do not think that I shall have much difficulty in preventing the employment of boys under 14 who have not reached the proper standard of proficiency, or of previous due attendance at school.

In May last I was asked to investigate a number of instances where it was alleged that boys were being illegally employed at Swanage. I found on inquiry that in more than half the cases I had been wrongly informed by the schoolmaster, who certainly ought to have taken more care to insure the accuracy of his assertions before complaining to me of breaches of the Education Act at the stone mines in his neighbourhood.

I append to my report a schedule with particulars of each fatal accident, the details of the Annual Returns, and a list of the mines in my district.

I have, &c.,
CLEMENT LE NEVE FOSTER,
H. M. Inspector of Mines.

To the Right Hon. R. A. Cross, M.P.,
Her Majesty's Principal Secretary of State,
Home Department, Whitehall.

LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in DR. C. LE NEVE FOSTER'S DISTRICT, comprising CORNWALL, DEVONSHIRE, DORSETSHIRE, and PART OF SOMERSETSHIRE, during the Year 1878.

Date.	No. of Accidents.	Name of the Mine.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous underground.	Above ground.
1878.													
Jan. 8	1	Wheal Uny	Redruth	Wheal Uny Mining Co.	William Perryman	Miner	40	Unexpected fall of ground	–	1	–	–	–
„ 17	2	Levant	St. Just	Levant Mining Co.	James Penrose	Tindresser	22	Fall of 7 feet on the stamps floors while in an epileptic fit.	–	–	–	–	1
„ 19	3	West Wheal Seton	Camborne	West Wheal Seton Mining Co.	Thomas Prisk	Miner, assisting the shaftmen.	47	Blow from a winch handle, which knocked him down a shaft.	–	–	1	–	–
Feb. 6	4	Wheal Kitty	St. Agnes	Wheal Kitty Mining Co.	George Reynolds	Miner	14	Fall from a ladder while ascending a shaft.	–	–	1	–	–
Mar. 14	5	Wheal Mary Hutchings.	Plympton	Wheal Mary Hutchings Mining Co.	John Lemin	Ditto	47	Unexpected fall of ground	–	1	–	–	–
„ 21	6	West Chiverton	Perranzabuloe	West Chiverton Mining Co.	Henry Sobey	Ditto	35	Ditto	–	1	–	–	–
„ 30	7	Wheal Agar	Redruth	Wheal Agar Mining Co.	John Pearce	Ditto	22	Unexpected explosion of a hole which had hung fire.	–	–	–	1	–
April 1	8	Tincroft	Pool	Tincroft Mining Co.	Richard Trevarthen	Ditto	20	Fall down some underhand stopes while climbing down over them by a chain.	–	–	–	–	1
„ 9	9	West Wheal Tolgus	Redruth	West Wheal Tolgus Mining Co.	John Harris	Engineman	37	Boiler explosion	–	–	–	1	–
„ 12	10	Pedn-an-drea	Ditto	Pedn-an-drea Consolidated Mining Co.	John Garland	Skip-filler	24	Blow from the chain, which knocked him down the shaft, when the skip dropped from the breaking of the timber on which it was resting.	–	–	1	–	–
June 7	11	Carnarvon	Brendon Hills	The Ebbw Vale Steel, Iron, and Coal Co., Limited.	William John Richards.	Miner	17	Injuries received while getting out of a tram in motion in which he had ridden up from underground in defiance of the rules of the mine.	–	–	1	–	–

List of Fatal Accidents—*continued.*

Date.	No. of Accidents.	Name of the Mine.	Where situate.	Owner's or Company's Name.	Persons killed.	Occupation.	Reputed age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions of Fire-damp.	Falls of Roof and Sides.	In Shafts.	Miscellaneous underground.	Above ground.
1878.													
June 22	12	West Wheal Seton	Camborne	West Wheal Seton Mining Co.	William Henry Hocking.	Miner	17	Unexpected fall of ground	–	1	–	–	–
July 1	13	Wheal Grenville	Ditto	Wheal Grenville Mining Co.	William Ivey	Ditto	20	Unexpected fall of ground which knocked him down the shaft.	–	1	–	–	–
,, 3	14	Dolcoath	Ditto	Dolcoath Mining Co.	John Richards	Trammer	29	Fall of 14 feet through an open trap hatch on a tram road.	–	–	–	–	1
,, 18	15	Wheal Grenville	Ditto	Wheal Grenville Mining Co.	William John Barnes.	Tindresser	11	Strangulation between one of the spokes of a waterwheel and the wheel-pit, while playing after having left work.	–	–	–	–	1
,, 22	16	Dolcoath	Ditto	Dolcoath Mining Co.	Abraham Rawlings	Miner, assisting timberman.	58	Fall from a tram-road into workings beneath.	–	–	–	1	–
,, 23	17	Ditto	Ditto	Ditto	James Dennis	Shaftman	38	Explosion of gunpowder while tamping a hole.	–	–	–	1	–
Sept. 27	18	Carn Brea	Redruth	Carn Brea Mining Co.	William Knuckey Joseph Allen	Shaftman Ditto	21 38	Explosion of remnants of dynamite in the bottom of a hole which had been previously fired.	–	–	–	2	–
,, ,,	19	Phœnix	Liskeard	Phœnix and West Phœnix United Mining Co.	John Blamey	Miner	57	Probably an unexpected fall of ground.	–	1	–	–	–
Oct. 24	20	Mellanear	Hayle	Mellanear Copper Mining Co., Limited.	John Pascoe	Labourer	16	Caught by machinery while oiling a bearing.	–	–	–	–	1
,, 25	21	Carn Brea	Redruth	Carn Brea Mining Co.	Elijah Whitford	Miner	15	Unexpected fall of ground	–	1	–	–	–
								Totals	–	7	4	6	5

Total { 21 fatal accidents. 22 deaths.

NUMBER of PERSONS EMPLOYED in and about the MINES in DR. C. LE NEVE FOSTER'S DISTRICT, and quantity of MINING PRODUCE for the Year 1878.

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above Ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
CORNWALL.													Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs. lbs.	Statute tons cwt. qrs.	
Agar, Wheal	–	–	59	59	–	–	2	–	10	22	34	93	—	—	—	—	*2,791 15 3	*Estimated to contain 162 tons 9 cwt. 1 qr. 14 lbs. of *black tin*.
Balmynheer	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Basset, Wheal	–	9	81	90	2	–	17	6	13	29	67	157	—	—	182 4 0	208 6 3 7	—	—
Basset and Grylls	–	–	–	–	2	–	3	2	1	2	10	10	—	—	—	11 18 1 15	—	—
Basset, West Wheal	–	8	280	288	2	1	49	28	95	63	238	526	—	—	127 4 0	690 17 1 5	—	—
Basset Valley	–	–	2	2	–	–	–	–	–	3	3	5	—	—	—	—	—	—
Bell Vean	–	–	1	1	–	–	–	–	–	7	7	8	—	—	—	—	—	—
Blackhay	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Blue Hills	–	–	38	38	–	–	2	2	7	16	27	65	—	—	—	45 3 3 0	—	—
Boscundle, New	–	4	12	16	–	–	–	–	–	9	9	25	—	—	—	—	—	—
Botallack	–	30	221	251	8	–	25	9	30	86	158	409	72 11 2	—	158 3 0	477 15 0 0	—	—
Boys, Wheal	–	–	5	5	–	–	–	–	–	–	–	5	—	—	—	—	*10 0 0	*Estimated to contain 4 cwt. of *black tin*.
Brothers, Wheal	–	1	3	4	–	–	4	1	–	5	10	14	0 15 0	—	—	0 12 1 25	—	Lead ore, 17 cwt. 3 qrs. Siver in bars, 153 ozs. Silver precipitate, 8 cwt. 2 qrs. 17 lbs.
Budnick Consols	–	–	5	5	–	–	1	1	–	–	2	7	—	—	—	5 0 3 0	—	—
Busy, North	–	–	17	17	–	–	1	3	12	5	21	38	—	21 13 3	148 15 2	32 7 3 9	—	Zinc ore, 326 tons 8 cwt. 3 qrs. Iron pyrites, 2 tons 12 cwt. 3 qrs.
Calstock Eastern Sett	–	3	12	15	–	–	1	1	1	2	5	20	—	91 7 0	10 18 1	—	—	—
Caradon, East	–	–	28	28	–	–	–	–	1	10	11	39	—	—	249 4 2	—	—	—
Caradon, South	–	17	258	275	8	–	7	18	27	64	124	399	—	—	6,406 11 2	—	—	—
Cargoll	–	–	30	30	–	–	5	–	4	11	20	50	—	—	—	—	—	Lead ore, 20 tons 2 cwt. 1 qr.
Carn Brea	4	53	284	337	6	2	46	38	79	211	382	719	78 13 2	—	428 17 2	1,195 0 2 20	—	—
Cathedral, New	–	–	2	2	–	–	–	–	1	2	3	5	—	—	—	—	—	—
Chiverton, East	–	–	9	9	–	–	–	–	–	7	7	16	—	—	—	—	—	Lead ore, 8 tons 16 cwt.

Number of Persons employed in and about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above Ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
													Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs. lbs.	Statute tons cwt. qrs.	
CORNWALL—*cont.*																		
Chiverton, New	–	–	–	–	–	–	1	–	–	2	3	3	—	—	—		—	Lead ore, 1 ton 2 cwt. 2 qrs.
Chiverton, West	–	4	148	152	5	3	48	23	70	17	166	318	—	—	—	—	—	Lead ore, 895 tons. Zinc ore, 3,284 tons.
Coates, Wheal	–	–	38	38	–	–	6	–	2	10	18	56	—	—	—	65 10 3 23	—	—
Combellack	–	–	14	14	–	–	6	1	–	8	15	29	—	—	—	18 8 0 0	—	—
Comford, Wheal	–	1	20	21	–	–	–	–	1	–	1	22	—	—	90 1 2	—	—	—
Condurrow, South	–	7	175	182	13	7	62	21	43	59	205	387	—	—	66 0 0	861 0 0 0	—	—
Cook's Kitchen	–	3	102	105	2	–	14	9	38	52	115	220	13 1 0	—	6 3 2	231 6 2 2	—	—
Cook's Kitchen, New	–	1	14	15	–	–	3	–	7	6	16	31	—	—	95 0 0	—	*172 0 0	*Estimated to contain $3\frac{1}{3}$ tons *black tin.*
Creegbrawse	–	2	9	11	–	–	–	–	1	1	2	13	—	—	—	—	*201 6 1	*Estimated to contain 10 tons 7 cwt. 3 qrs. *black tin.*
Crinnis and Carlyon, Great.	–	–	18	18	–	–	2	2	2	8	14	32	—	—	185 14 0	—	—	—
Crofty, South Wheal	–	–	89	89	4	–	21	11	30	47	113	202	304 11 0	—	1,810 13 2	173 9 3 0	—	—
Ding Dong	–	–	–	–	–	–	–	–	–	–	–	–		—	—	9 18 2 23	—	Mine closed early in January 1878.
Dolcoath	–	3	402	405	36	11	133	79	125	252	636	1,041	59 11 0	—	14 4 0	1,524 12 2 22	—	—
Drakewalls	–	–	7	7	2	–	12	2	–	14	30	37	—	—	—	29 17 3 5	—	—
Duchy Peru	2	3	16	21	2	–	5	1	3	19	30	51	—	—	—	—	—	Iron ore, 17 tons. Zinc ore, 140 tons 18 cwt. 1 qr.
Eliza Consols	–	21	128	149	1	–	23	3	17	41	85	234	—	—	—	626 8 0 0	—	—
Eliza, West Wheal	–	3	44	47	–	–	12	–	4	21	37	84	—	—	—	83 18 3 0	—	—
Fortune, Great Wheal	–	–	4	4	3	–	7	3	3	2	18	22	—	—	—	7 5 1 16	—	Partially dressed tin ore, 9 tons. Estimated to contain 3 tons of *black tin.*
Frances, West Wheal	–	2	119	121	11	–	30	30	29	54	154	275	—	—	—	339 1 3 16	—	—
Frances, South Wheal	–	6	111	117	7	–	39	17	28	59	150	267	—	—	—	532 1 0 13	—	—
Glasgow Caradon	–	8	85	93	1	–	11	10	7	21	50	143	—	—	2,690 0 0	—	—	—
Godolphin, West	–	–	96	96	7	1	13	–	16	26	63	159	—	—	96 19 1	182 5 2 5	—	—
Goodevere	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Goole Pellas	–	1	64	65	1	–	17	3	7	24	52	117	—	—	—	148 8 1 21	—	—
Gover	–	–	5	5	–	–	2	–	1	1	4	9	—	—	—	3 19 3 19	—	—

Number of Persons employed in and about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above Ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed. (*Tinstuff*).	Other Minerals.
CORNWALL—*cont.*													Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs. lbs.	Statute tons cwt. qrs.	
Gravel Hill	1	2	13	16	1	–	3	–	–	14	18	34	—	—	—	—	—	Iron ore, 930 tons.
Great Work	–	–	7	7	–	–	3	–	1	5	9	16	—	—	—	63 11 2 10	—	—
Grenville, Wheal	–	3	125	128	2	1	30	14	24	38	109	237	—	—	6 15 0	240 7 3 3	—	—
Greystone Wood	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	Manganese ore, 35 tons.
Gunnislake Clitters	–	2	56	58	–	–	19	19	12	13	63	121	—	—	1,930 3 0	—	—	—
Hendra, New	–	–	2	2	–	–	–	–	–	2	2	4	—	—	—	—	—	—
Hermon, Wheal	–	–	3	3	–	–	3	–	1	3	7	10	—	—	—	6 15 2 25	—	—
Herodsfoot	–	–	30	30	1	–	7	1	20	1	30	60	—	—	—	—	—	Lead ore, 307 tons 16 cwt. 1 qr.
Hingston Down	–	2	57	59	–	–	3	4	7	20	34	93	—	18 10 1	1,700 15 2	—	—	—
Holmbush	–	–	32	32	–	–	–	2	–	29	31	63	—	692 6 0	—	—	—	—
Jane, Wheal	–	8	60	68	3	–	32	3	10	34	82	150	—	—	5 12 1	197 0 0 0	—	Iron pyrites, 216 tons.
Jane, West Wheal	–	–	4	4	–	–	–	–	1	1	2	6	—	—	—	—	*154 0 0	*Estimated to contain 2¾ tons of *black tin*. Iron pyrites, 14 tons 6 cwt.
Jewell, New Wheal	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Kelly Bray	–	–	10	10	–	–	–	1	–	1	2	12	—	17 1 2	—	—	—	—
Killifreth	–	3	58	61	–	–	6	1	10	12	29	90	—	—	110 0 0	—	—	Partially dressed tin ore (*whits*), 156 tons. Estimated to contain 32 tons 15 cwt. of *black tin*.
Kingston Consols	–	3	30	33	–	–	10	–	7	–	17	50	—	—	1 0 0	—	—	Lead ore, 63 tons. Zinc ore, 116 tons.
Kit Hill Tunnel	–	–	14	14	–	–	–	–	–	–	–	14	—	—	—	—	—	—
Kitty, Wheal	–	7	95	102	11	–	11	6	18	35	81	183	—	—	13 18 0	219 16 1 19	—	—
Langford, Wheal	–	–	4	4	–	–	1	–	–	3	4	8	—	—	—	—	—	—
Leisure, New Wheal	–	–	6	6	–	–	–	–	–	–	–	6	—	—	—	—	—	—
Levant	1	11	180	192	9	–	20	5	12	56	102	294	—	—	741 2 1	233 3 1 21	—	—
Levant, North	2	10	57	69	–	–	5	5	11	28	49	118	—	—	—	81 19 1 17	—	—
Lidcott and West Downend.	–	–	8	8	–	–	1	1	1	–	3	11	—	—	—	—	—	Manganese ore, 60 tons.
Livingstone Consols	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	—
Lovell, The	–	–	30	30	–	–	10	–	2	5	17	47	—	—	—	20 4 0 8	—	—
Lovell, East	–	–	31	31	–	–	4	–	–	12	16	47	—	—	—	28 10 3 11	—	—
Marke Valley	–	9	115	124	8	–	32	13	17	36	106	230	—	—	4,499 17 0	—	—	—

Number of Persons employed in and about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Under ground and Above Ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin.*)	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
CORNWALL—*cont.*													Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs. lbs.	Statute tons cwt. qrs.	
Mary, West Wheal	–	–	3	3	–	–	–	–	–	–	–	3	—	—	—	—	—	—
Mary Ann, West	–	1	16	17	–	–	–	–	–	–	–	17	—	—	—	—	—	—
Medlyn Moor	–	–	24	24	–	–	4	–	5	8	17	41	—	—	—	18 5 1 21	—	—
Mellanear	–	5	134	139	–	3	14	41	43	45	146	285	—	—	5,648 0 0	—	—	—
New Consols	–	–	12	12	–	–	2	–	–	7	9	21	95 5 1	2,005 15 3	53 4 3	5 3 2 9	—	—
Newton, Wheal	–	5	68	73	–	–	1	–	3	8	12	85	—	9 15 2	—	—	—	Silver ore, 84 tons 10 cwt. 2 qrs. 1 lb.
North Cornwall	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	—
Okel Tor	–	6	27	33	2	–	3	3	2	20	30	63	317 0 0	—	—	—	—	—
Owles, Wheal	–	15	106	121	8	–	25	8	25	41	107	228	—	—	183 0 0	219 0 0 0	—	Uranium ore, 3 cwt.
Park of Mines	–	–	12	12	–	–	6	–	1	13	20	32	—	—	—	32 4 1 22	—	—
Pawton	–	–	12	12	–	–	–	–	–	2	2	14	—	—	—	—	—	—
Pedn-an-drea	–	6	90	96	16	4	44	19	19	70	172	268	63 5 0	—	2 12 1	212 16 1 21	—	—
Peevor, Wheal	–	12	139	151	6	–	26	11	23	46	112	263	—	—	—	485 1 2 4	—	Partially dressed tin ore (*whits*), 785 tons 9 cwt. 3 qrs. Estimated to contain 61 tons 10 cwt. 0 qrs. 20 lbs. of *black tin.*
Peevor, West Wheal	–	–	10	10	–	–	–	–	–	–	–	10	—	—	—	—	—	—
Penhalls	–	–	103	103	–	–	23	2	13	42	80	183	—	—	—	198 5 3 0	—	—
Penstruthal	–	5	45	50	–	–	3	1	3	10	17	67	—	—	89 0 0	46 9 2 14	—	—
Perseverance	–	–	3	3	–	–	–	–	–	–	–	3	—	—	—	—	*122 0 0	*Estimated to contain 4½ tons of *black tin.*
Phœnix and West Phœnix.	–	25	205	230	47	3	89	35	18	109	301	531	—	—	453 3 0	691 9 2 1	—	—
Phœnix, South	–	–	12	12	1	–	4	–	–	6	11	23	—	—	—	19 7 0 24	—	—
Polberro	–	–	6	6	1	–	4	–	4	7	16	22	—	—	—	20 8 1 17	—	—
Poldice	–	–	3	3	–	–	–	–	4	2	6	9	—	21 0 0	19 18 2	6 5 3 0	—	—
Poldice, West	–	–	10	10	9	1	8	2	18	16	54	64	—	22 0 0	0 17 0	6 13 1 8	274 13 3	Estimated to contain 14 tons of *black tin.*
Polgooth	–	1	1	2	–	–	3	–	2	2	7	9	—	—	—	7 0 0 0	—	—
Polmear, South	–	–	6	6	–	–	–	–	–	–	–	6	—	—	—	—	—	—
Polrose	–	–	38	38	1	–	7	1	5	9	23	61	—	—	—	29 4 0 0	—	—

Number of Persons employed in and about the Mines, &c.—*continued.*

Name of Mine	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
CORNWALL—*cont.*													Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs. lbs.	Statute tons cwt. qrs.	
Pool, East	–	10	182	192	1	1	4	26	35	50	117	309	376 0 0	—	2,564 11 0	489 15 2 16	*5,904 0 0	* Estimated to contain 287 tons 13 cwts. 3 qrs. 15 lbs. of *black tin*. Uranium ore, 5 cwt. 20 lbs. Wolfram, 10 tons.
Prince of Wales	–	–	6	6	–	–	–	–	–	–	–	6	—	—	37 0 0	—	—	Silver ore, $1\frac{3}{4}$ tons.
Providence	–	–	–	–	–	–	6	3	2	9	20	20	—	—	3 8 1	13 17 0 14	—	—
Providence, South	–	–	–	–	4	–	1	–	3	2	10	10	—	—	—	4 0 0 17	—	—
Prussia, Wheal	–	5	50	55	–	–	1	1	9	19	30	85	—	—	—	130 13 1 23	—	—
Reinoor	–	–	5	5	–	–	–	–	–	–	–	5	—	5 14 0	—	1 19 2 26	—	Copper precipitate, 7 tons 4 cwt. 3 qrs. 18 lbs.
Relistian Consols	–	–	–	–	–	–	–	–	–	–	–	–	1 4 2	—	—	—	—	—
Restormel	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	Iron ore, 344 tons 10 cwt.
Retallack, Great	–	–	8	8	–	–	4	6	1	1	12	20	—	—	—	—	—	Zinc ore, 188 tons 18 cwt.
Rodd, Great Wheal	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Roskear, South	–	–	65	65	1	–	13	4	14	4	36	101	94 3 3	—	41 19 2	29 5 2 24	—	Zinc ore, 32 tons 7 cwt.
Roskear, West	–	–	31	31	–	–	–	10	17	15	42	73	—	—	58 9 2	—	*2 10 0	* Estimated to contain 2 cwt. of *black tin*. Lead ore, 11 tons 2 cwt. 1 qr. Zinc ore, 183 tons 10 cwt. 1 qr.
Ruthers	–	–	–	–	–	–	–	–	–	1	1	1	—	—	—	—	—	Manganese ore, 49 tons 4 cwt.
St. Aubyn United	–	4	14	18	–	–	–	–	–	5	5	23	—	—	—	—	—	—
St. Austell Consols	–	–	58	58	1	–	19	4	11	21	56	114	—	—	—	62 7 0 3	—	—
St. Breward Consols	–	–	1	1	–	–	–	–	–	–	–	1	—	—	—	—	—	—
St. George	–	–	8	8	–	–	–	–	–	2	2	10	—	—	—	—	—	—
St. Ives Consols	–	–	3	3	3	–	18	6	4	32	63	66	—	—	—	66 12 0 2	—	—
St. Just Amalgamated	1	2	23	26	1	–	3	–	5	7	16	42	—	—	—	27 10 3 7	—	—
St. Neot	–	–	4	4	–	–	3	–	–	1	4	8	—	—	—	—	—	Slate, 364 tons.
Seton, West Wheal	–	8	150	158	23	13	50	19	57	52	214	372	200 2 0	—	2,200 3 0	239 12 1 6	—	—

Number of Persons employed in and about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
CORNWALL—*cont.*													Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs.	Statute tons cwt. qrs. lbs.	Statute tons cwt. qrs.	
Seymour, Wheal	–	–	1	1	–	–	–	–	–	4	4	5	—	—	1 10 0	—	—	Zinc ore, 5 tons.
Silver Vein	–	–	–	–	–	–	–	–	–	–	–	–	—	—	—	—	—	Copper precipitate, 1 ton 7 cwt. 2 qrs.
Sisters, Wheal	–	13	294	307	32	5	48	19	12	61	177	484	—	—	—	600 1 3 8	—	—
South Tolcarne	–	2	10	12	–	–	–	–	–	4	4	16	—	—	6 18 0	—	—	—
South Wendron	–	–	4	4	–	–	–	–	–	1	1	5	—	—	—	—	—	—
S pearnMoor	–	–	–	–	–	–	–	–	–	3	3	3	—	—	—	1 0 3 24	—	—
Tallack, Wheal	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	—
Tamping Quarry	–	–	2	2	–	–	–	–	–	–	–	2	—	—	—	—	—	Tamping stone, 60 tons.
Terras, South	–	–	8	8	–	–	1	2	–	4	7	15	—	—	—	—	—	Ochre, 70 tons.
Tincroft	–	8	165	173	6	4	70	35	64	138	317	490	—	—	116 7 2	754 2 1 9	—	—
Tincroft, New	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	*199 7 0	*Estimated to contain 4 tons 7 cwt. 2 qrs. of *black tin*.
Tolgus Consols	–	–	9	9	–	–	–	–	1	3	4	13	—	—	—	—	—	—
Tolgus, West Wheal	–	2	121	123	–	6	14	21	26	37	104	227	—	—	3,752 1 2	—	—	—
Treamble	1	2	7	10	1	–	2	–	1	7	11	21	—	—	—	—	—	Lead ore, 15 cwt. 3 qrs.
Trebeigh Consols	–	–	8	8	–	–	–	–	–	4	4	12	—	—	—	—	—	—
Treburgett, Old	–	–	16	16	–	–	6	–	3	11	20	36	—	—	0 2 3	—	—	Lead ore, 37 tons 5 cwt. 3 qrs.
Treleigh Wood	–	2	56	58	–	–	25	15	5	5	50	108	—	—	—	75 14 0 0	—	—
Tresellyn	–	–	3	3	–	–	–	–	–	–	–	3	—	—	—	—	—	—
Treskerby, North	–	1	44	45	–	–	2	–	7	14	23	68	—	0 0	132 18 2	—	16 5 0	Estimated to contain 5 cwt. 2 qrs. 4 lbs. of *black tin*.
Trevaunance, Wheal	–	–	15	15	–	–	–	–	–	–	–	15	—	—	—	7 0 0 0	—	—
Trumpet Consols	–	–	3	3	8	2	12	4	1	10	37	40	—	—	0 17 2	52 2 3 13	—	—
Unity Wood, Wheal	–	–	–	–	–	–	1	2	2	8	13	13	—	20 19 1	2 15 0	2 7 0 10	—	—
Uny, Wheal	–	3	95	98	9	1	32	25	57	59	183	281	—	—	—	433 0 0 0	—	—
Violet Seton	–	–	6	6	–	–	–	–	–	2	2	8	—	—	—	—	—	—
West Vor	–	–	7	7	–	–	–	–	–	–	–	7	—	—	—	—	—	—
Totals for Cornwall	8	393	6,683	7,084	339	69	1,431	724	1,394	2,705	6,662	13,746	1,676 3 2	—	37,144 14 1	13,585 3 3 3	—	

Number of persons employed in and about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
DEVONSHIRE.													Statute tons cwt. qrs. lbs.	Statute tons cwt. qrs.	Statute tons. cwt. qrs.	Statute tons. cwt. qrs. lbs.	Statute tons. cwt. qrs.	
Aller	–	–	12	12	–	–	–	–	–	9	9	21	—	—	—	—	—	—
Bampfylde	–	–	12	12	–	–	2	–	1	4	7	19	—	—	30 0 0	—	—	—
Bedford United	–	13	35	48	–	–	7	8	8	10	33	81	—	442 19 2	1,151 0 2	—	—	Fluor spar, 7 tons 7 cwt.
Birch Tor	–	–	–	–	–	–	–	–	–	3	3	3	—	—	—	6 5 3 13	—	—
Brimley	–	–	6	6	–	–	–	–	–	2	2	8	—	—	—	—	—	—
Buckland	–	–	5	5	–	–	5	–	–	40	45	50	—	—	—	—	—	Slate, 1,300 tons.
Chillaton and Hogstor.	–	–	6	6	2	–	11	–	3	4	20	26	—	—	—	—	—	Manganese ore, 1,100 tons.
Combmartin	–	–	12	12	–	–	–	–	–	–	–	12	—	—	—	—	—	—
Combmartin, West	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Courtenay, Wheal	–	1	4	5	–	–	–	–	2	2	4	9	—	—	41 15 0	—	—	—
Crebor, Wheal	–	1	35	36	–	–	6	–	4	11	21	57	—	—	788 0 0	—	—	—
Dean Prior	–	–	10	10	–	–	–	–	–	2	2	12	—	—	—	—	—	—
Devon Gt. Consols	–	7	207	214	5	3	67	43	16	243	377	591	2,122 2 1 19	—	9,394 16 0	—	—	—
Eleanor, Gt. Wheal	–	–	6	6	–	–	2	–	–	1	3	9	—	—	—	10 16 1 8	—	—
Emily, The	–	–	6	6	–	–	–	–	3	3	6	12	—	—	67 13 2	—	—	—
Florence	–	–	21	21	–	–	–	–	–	8	8	29	—	—	—	—	—	Iron ore, 2,769 tons.
Frank Mills	–	4	28	32	–	–	–	–	1	62	63	95	—	—	—	—	—	Lead ore, 219 tons 15 cwt. 2 qrs.
Friendship, Wheal	–	–	4	4	7	2	16	12	7	23	67	71	370 11 0 18	3 0 0	—	26 14 0 19	—	—
Fullabrook	–	–	6	6	–	–	–	–	–	3	3	9	—	—	—	—	—	—
Gawton	–	6	18	24	1	–	8	9	2	14	34	58	—	234 0 0	949 7 2	—	—	—
Haytor	–	–	4	4	–	–	1	–	–	4	5	9	—	—	—	—	—	Iron ore, 724 tons.
Holne Chase	–	–	5	5	–	–	–	–	–	1	1	6	—	—	—	—	—	—
Kiln Close, King's Meadow and Brickfield.	–	–	24	24	–	–	–	–	–	–	–	24	—	—	—	—	—	Potter's clay, 6,989 tons.
Kingsteignton Clay Mines.	–	–	44	44	–	–	4	–	–	3	7	51	—	—	—	—	—	Potter's clay, 15,003 tons.
Maria and Fortescue, West.	–	–	10	10	–	–	2	2	9	10	23	33	123 14 2 0	—	299 11 0	—	—	—
Mary Hutchings, Wheal.	–	–	16	16	2	–	4	–	–	12	18	34	172 3 1 4	—	—	0 12 0 0	—	—
Mid-Devon	–	–	6	6	–	–	2	–	–	5	7	13	—	—	22 1 0	—	—	—
Newton, St. Cyres	–	–	2	2	–	–	–	–	1	2	3	5	—	—	—	—	—	Manganese ore, 248 tons.

Number of persons employed in and about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
DEVONSHIRE.—*cont.*													Statute tons. cwt. qrs. lbs.	Statute tons. cwt. qrs.	Statute tons. cwt. qrs.	Statute tons. cwt. qrs. lbs.	Statute tons. cwt. qrs.	
Parracombe	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Penn Recca	–	–	13	13	–	–	22	–	–	57	79	92	—	—	—	—	—	Slate, 464 tons.
Ramsdown	–	–	18	18	–	–	2	–	–	6	8	26	—	—	—	—	—	—
Russell, Wheal	–	–	12	12	–	–	–	–	–	10	10	22	—	—	60 0 0	—	—	—
South Devon	–	–	–	–	–	–	–	–	–	5	5	5	—	—	—	—	—	—
South Molton Consols	–	–	8	8	–	–	1	1	1	2	5	13	—	—	—	—	—	Lead ore, 13 tons 19 cwt. 1 qr.
Steeperton	–	–	13	13	–	–	3	–	–	11	14	27	—	—	—	1 0 2 22	—	—
Stert	–	–	5	5	–	–	2	–	–	17	19	24	—	—	—	—	—	Slate, 502½ tons.
Tamar Valley	–	–	10	10	–	–	–	–	–	2	2	12	—	—	—	—	—	—
Teignbridge	–	–	8	8	–	–	–	–	–	2	2	10	—	—	-	—	—	Potter's clay, 4,241 tons.
Teign Valley	–	–	2	2	–	–	1	–	2	3	6	8	—	—	—	—	—	Barytes (sulphate), 312 tons 14 cwt.
Vitifer, East	–	–	4	4	–	–	–	–	–	1	1	5	—	—	—	1 17 2 26	—	—
Totals for Devonshire	–	32	645	677	17	5	168	75	60	597	922	1,599	2,788 11 1 13	679 19 2	12,804 4 2	47 6 3 4	—	
SOMERSETSHIRE.																		
Brendon Hills	–	3	185	188	9	–	20	–	–	42	71	259	—	—	—	—	—	Iron ore, 40,115 tons 6 cwt.
Lower Thorne	–	–	4	4	–	–	–	–	–	–	–	4	—	—	—	—	—	—
Totals for part of Somersetshire.	–	3	189	192	9	–	20	–	–	42	71	263	—	—	—	—	—	

Number of persons employed in and about the Mines, &c.—*continued.*

Name of Mine.	Underground. Male Persons Ages. 12 to 13.	13 to 16.	Above 16.	Total.	Above Ground. Ages 8 to 13. Males.	Females.	Ages 13 to 18. Males.	Females.	Ages above 18. Females.	Males.	Total.	Total Underground and Above ground.	Arsenic.	Arsenical Pyrites.	Copper Ore.	Tin Ore, Dressed (*Black Tin*).	Tin Ore, Undressed (*Tinstuff*).	Other Minerals.
DORSETSHIRE.													Statute tons. cwt. qrs. lbs.	Statute. tons. cwt. qrs.	Statute. tons. cwt. qrs.	Statute tons. cwt. qrs. lbs.	Statute tons. cwt. qr	
Furzy Ground -	–	–	38	38	2	–	12	–	–	36	50	88	—	—	—	—	—	Potter's and other clays, 25,000 tons.
Kimeridge -- -	–	–	10	10	–	–	–	–	–	–	–	10	—	–	—	—	—	Cement stone, 1,924½ tons.
Seymours - -	–	–	14	14	–	–	–	–	–	6	6	20	—	—	—	—	—	Potter's and other clays, 9,028 tons.
Purbeck mines -	1	2	142	145	6	–	35	–	–	72	113	258	—	—	—	—	—	Purbeck stone, dressed, 12,939 tons 10 cwt.; undressed,
Totals for Dorsetshire.	1	2	204	207	8	–	47	–	–	114	169	376	—	—	—	—	—	

LIST of MINES in CORNWALL, DEVONSHIRE, DORSETSHIRE, and Part of SOMERSETSHIRE at work during the Year 1878.

No.	Name.	Minerals raised.	Situation and Postal Address.	Owner.	Agent.*
			CORNWALL.		
1	Agar, Wheal -	Tin & Copper	Redruth -	Wheal Agar Mining Co. -	*C. Bawden.*
2	Balmynheer - -	Tin -	Wendron -	Balmynheer Mining Co., Limited.	F. Michell.
3	Basset, Wheal -	Tin & Copper	Redruth -	Wheal Basset Mining Co.	W. C. Trevena.
4	Basset and Grylls	Tin - -	Wendron -	Basset and Grylls Mining Co.	Paul Prisk.
5	Basset, West Wheal	Tin & Copper	Redruth -	West Wheal Basset Mining Co.	James Nicholas.
6	Basset Valley -	Tin - -	St. Agnes	Richards, Power, & Co. -	H. Dale.
7	Bell Vean -	Tin - -	Redruth -	Bell Tin Mining Co. -	John Brokenshire.
8	Blackhay - -	Iron - -	Withiel -	Agra Bank Co., Limited -	P. Mitchell, jun.
9	Blue Hills - -	Tin - -	St. Agnes - Scorrier.	Blue Hills Mining Co. - -	S. Bennetts.
10	Boscundle, New -	Tin - -	St. Austell	R. H. Williams & Co. -	R. H. Williams.
11	Botallack - -	Tin & Copper	St. Just, Penzance.	Botallack Mining Co. - -	*S. H. James.*
12	Boys, Wheal -	Tin - -	Redruth -	T. Pryor and F. Mitchell -	*T. Pryor.*
13	Brothers, Wheal -	Silver & Tin	Harrowbarrow, St. Mellion.	R. Henderson - -	J. W. Doble.
14	Budnick Consols -	Tin & Lead	Perranzabuloe	F. G. Enys - - -	*R. Glanville.*
15	Busy, North -	Tin - -	Chacewater	North Busy United Mining Co.	H. Trevethan.
16	Calstock Eastern Sett	Copper -	Calstock, Tavistock.	Wheal Calstock Eastern Sett Mining Co., Limited.	W. B. Collom.
17	Caradon, East - -	Copper -	Linkinhorne, Liskeard.	East Caradon Mining Co. -	James Kellow.
18	Caradon, South -	Copper -	St. Cleer, Liskeard.	South Caradon Mining Co. -	John Holman.
19	Cargoll - -	Lead & Zinc	Newlyn, East Grampound Road.	Cargoll Mining Co. - -	John Jennings.
20	Carn Brea - -	Tin & Copper	Redruth -	Carn Brea Mining Co. -	William Teague.
21	Cathedral, New -	Tin - -	St. Day, Scorrier.	New Cathedral Mining Co., Limited.	Joseph Michell.
22	Chiverton, East -	Lead - -	Perranzabuloe, Truro.	East Chiverton Mining Co.	Richard Southey.
23	Chiverton, New -	Lead - -	Perranzabuloe, Truro.	New Chiverton Mining Co., Limited.	*C. W. Clinton,* liquidator.
24	Chiverton, West -	Lead & Zinc	Perranzabuloe, Truro.	West Chiverton Mining Co.	Richard Southey.
25	Coates, Wheal -	Tin - -	St. Agnes, Scorrier.	Wheal Coates Tin Mining Co., Limited.	W. H. Martin.
26	Combellack - -	Tin - -	Wendron, Helston.	Combellack Mining Co., Limited.	Stephen Roberts.
27	Comford, Wheal -	Tin - -	Redruth -	Wheal Comford Mining Co.	*J. L. Peter.*
28	Condurrow, South	Tin - -	Camborne -	South Condurrow Mining Co.	W. Rich.
29	Cook's Kitchen -	Tin - -	Camborne -	Cook's Kitchen Mining Co. -	Josiah Thomas.
30	Cook's Kitchen, New	Tin & Copper	Camborne -	New Cook's Kitchen Mining Co.	Josiah Thomas.
31	Creegbrawse -	Tin - -	Chacewater	Creegbrawse Tin Mining Co.	W. Giles.
32	Crinnis and Carlyon, Great.	Copper - -	St. Austell	R. H. Williams and others -	R. H. Williams.
33	Crofty, South Wheal.	Tin & Copper	Pool, Camborne.	South Wheal Crofty Mining Co.	Josiah Thomas.
34	Ding Dong -	Tin - -	Gulval, Penzance.	Ding Dong Mining Co. -	*R. Wellington.*
35	Dolcoath - -	Tin & Copper	Camborne -	Dolcoath Mining Co. -	Josiah Thomas.
36	Drakewalls -	Tin - -	Calstock, Tavistock.	Drakewalls Tin and Copper Mining Co.	M. Bawden.

* If secretary or purser, the name appears in *Italics*.

List of Mines—*continued.*

No.	Name.	Minerals raised.	Situation and Postal Address.	Owner.	Agent.
37	Duchy Peru -	Iron & Zinc	Newlyn East, Grampound Road.	The New Perran Minerals Co., Limited.	James Henderson.
38	Eliza Consols, Wheal	Tin & Copper	St. Austell -	Wheal Eliza Consols Mining Co.	R. H. Williams.
39	Eliza, West Wheal	Tin & Copper	St. Austell	West Wheal Eliza Mining Co.	R. H. Williams.
40	Fortune, Great Wheal.	Tin - -	Breage, Helston.	Great Wheal Fortune Mining Co.	S. Harris.
41	Frances, South Wheal.	Tin - -	Redruth -	South Wheal Frances Mining Co.	A. T. James.
42	Frances, West Wheal.	Tin - -	Camborne -	West Wheal Frances Mining Co.	Josiah Thomas.
43	George, Wheal -	Arsenic -	Harrow-barrow, St. Mellion.	T. Bulkley & Co. - -	W. R. Footner.
44	Glasgow Caradon Consols.	Copper -	St. Ive, Liskeard.	Glasgow Caradon Consolidated Mining Co., Limited.	William Taylor.
45	Godolphin, West -	Tin - -	Germoe, Marazion.	West Godolphin Mining Co.	John Pope.
46	Goodevere - -	Tin - -	Altarnun, Liskeard.	The Goodevere Mining Co., Limited.	*C. J. Sims.*
47	Goole Pellas -	Tin - -	Towednack, St. Ives.	M. G. Brown - -	W. Buglehole.
48	Gover - -	Iron & Tin	St. Austell -	W. Browne & Sons -	R. Hancock.
49	Gravel Hill -	Iron -	Newlyn East, Grampound Road.	The New Perran Minerals Co., Limited.	James Henderson.
50	Great Work -	Tin - -	Breage, Marazion.	Great Work Mining Co. -	William Teague.
51	Grenville, Wheal -	Tin & Copper	Camborne -	Wheal Grenville Mining Co.	T. Hodge.
52	Greystone Wood -	Manganese	Lezant, Launceston.	William Langdon - -	William Langdon.
53	Gunnislake Clitters	Tin & Copper	Gunnislake, Tavistock.	Gunnislake Clitters Mining Co.	William Skewis.
54	Hendra, New -	Tin - -	Breage, Helston.	New Hendra Mining Co. -	Richard King.
55	Hermon, Wheal -	Tin - -	St. Just, Penzance.	Wheal Hermon Mining Co.	*R. Boyns.*
56	Herodsfoot -	Lead -	Lanreath, Liskeard.	Herodsfoot Mining Co. -	Peter Temby.
57	Hingston Down -	Copper -	Gunnislake, Tavistock.	The Hingston Down Consols Mining Co., Limited.	Thomas Richards.
58	Holmbush - -	Copper and Arsenic.	Callington -	Holmbush, Limited - -	*S. Boome.*
59	Jane, Wheal -	Tin - -	Kea, Chacewater.	Wheal Jane Mining Co. -	R. Southey.
60	Jane, West Wheal	Tin and Iron Pyrites.	Chacewater	John Smith - -	John Smith.
61	Jewell, New Wheal	Lead - -	Perranporth	W. Jewell - - -	W. Jewell.
62	Kelly, Bray - -	Arsenic and Copper.	Callington -	Emmens & Co., Limited -	S. H. Emmens.
63	Killifreth - -	Tin - -	Chacewater	Killifreth Mining Co. -	*John Tregoning.*
64	Kingston Consols -	Lead - -	Stoke Climsland, Callington.	Kingston Consols Silver-Lead Mining Co., Limited.	William Hancock.
65	Kit Hill Tunnel -	- - - -	Callington -	Kit Hill Tunnel Co., Limited	S. H. Emmens.
66	Kitty, Wheal -	Tin - -	St. Agnes -	Wheal Kitty Mining Co. -	William Teague.

List of Mines—*continued.*

No.	Name.	Minerals raised.	Situation and Postal Address.	Owner.	Agent.
67	Langford, Wheal	- - -	Callington	Baring and Langford, Limited	S. H. Emmens.
68	Leisure, New Wheal	Copper	Perranporth, Truro.	Francis Blight - - -	Francis Blight.
69	Levant - -	Tin & Copper	St. Just, Penzance.	Levant Mining Co. - -	*R. White.*
70	Levant, North	Tin	St. Just, Penzance.	North Levant Mining Co.	James Bennetts.
71	Lidcott and West Downend.	Manganese	Launceston	J. C. Pawle - -	*H. J. Nicholls.*
72	Livingstone Consols	Tin - -	St. Agnes	Reynolds & Co. - - -	W. Vivian.
73	Lovell, The -	Tin - -	Wendron, Helston.	The Lovell Mining Co. -	Joseph Prisk.
74	Lovell, East Wheal	Tin -	Wendron, Helston.	East Wheal Lovell Mining Co.	Richard Quentrall.
75	Marke Valley -	Tin & Copper	Linkinhorne, Liskeard.	Marke Valley Mining Co. -	William George.
76	Mary, West Wheal	Copper -	North Country, Redruth.	Henry Tellam - -	Henry Tellam.
77	Mary Ann, West Wheal.	Lead -	Liskeard -	West Wheal Mary Ann Mining Co.	*W. G. Nettle.*
78	Medlyn Moor -	Tin -	Wendron, Helston.	Medlyn Moor Mine Co. -	J. Prisk.
79	Mellanear -	Copper -	Hayle -	Mellanear Copper Mining Co., Limited.	John Gilbert.
80	New Consols -	Copper, Tin, and Arsenic.	Stoke Climsland, Callington.	New Consols Silver and Arsenic Works, Limited.	*Watson Smith* and *James Pearce*, liquidators.
81	Newton Wheal -	Arsenic and Silver.	Harrowbarrow, St. Mellion.	Wheal Newton, Limited -	S. H. Emmens.
82	North Cornwall -	Silver-Lead	Callington -	The North Cornwall Silver-Lead Mining Co., Limited.	Thomas Doidge.
83	Okel Tor - -	Arsenic -	Calstock, Tavistock.	H. N. Lay - - -	H. N. Lay.
84	Owles, Wheal -	Tin -	St. Just, Penzance.	R. Boyns, A. Chenhalls, and others.	R. Boyns.
85	Park of Mines -	Tin -	St. Enoder, Grampound Road.	Broderick and Parker -	James Evans.
86	Pawton - -	Iron -	St. Breock, Wadebridge.	Pawton and New Mills Iron Mining Co.	J. R. Harvey.
87	Pedn-an-drea -	Tin -	Redruth -	Pedn-an-drea Consolidated Mining Co.	William Tregay.
88	Peevor, West -	Tin -	Redruth -	West Peevor Mining Co. -	*Thomas Pryor.*
89	Peevor, Wheal -	Tin -	Redruth -	Wheal Peevor Mining Co. -	*Thomas Pryor.*
90	Penhalls - -	Tin -	St. Agnes, Scorrier.	Penhalls Mining Co. -	S. Bennetts.
91	Penstruthal Consols.	Tin & Copper	Gwennap -	Penstruthal Consols Tin and Copper Mining Co., Limited.	Richard Rendle.
92	Perseverance -	Tin -	Redruth -	Perseverance Mining Co., Limited.	William Rich.
93	Phœnix and West Phœnix United.	Tin & Copper	Linkinhorne, Liskeard.	Phœnix and West Phœnix United Mining Co.	John Truscott.
94	Phœnix, South -	Tin -	Linkinhorne, Liskeard.	Henry Houseman - -	James Kelly.
95	Polberro - -	Tin -	St. Agnes, Scorrier.	John Taylor and Sons, and others.	John Hancock
96	Poldice - -	Tin & Copper	St. Day, Scorrier.	Sir F. M. Williams, Bart. -	*H. Michell.*
97	Poldice, West -	Tin -	Gwennap, Scorrier.	West Poldice Mining Co. -	*H. Michell.*

List of Mines—*continued.*

No.	Name.	Minerals raised.	Situation and Postal Address.	Owner.	Agent.
98	Polgooth - -	Tin -	St. Austell	Richard Hancock - -	Richard Hancock.
99	Polrose Mine -	Tin -	Breage, Helston.	Polrose Mining Co. -	T. Roach.
100	Pool, East - -	Tin, Copper, Arsenic, Bismuth, Cobalt, Uranium, and Wlofram.	Illogan, Camborne.	East Pool Mining Co. -	John Maynard.
101	Prince of Wales -	Tin & Copper	St. Mellion, Callington.	Prince of Wales Mining Co.	John Andrews.
102	Providence -	Tin & Copper	St. Ives -	The Providence Mines Co. -	*E. Trythall.*
103	Providence, South	Tin -	Towednack, St. Ives.	S. Bewley - - -	William Pascoe.
104	Prussia, Wheal -	Tin -	Redruth -	Wheal Prussia Mining Co. -	William Tregay.
105	Redmoor - -	- - -	Callington -	Emmens & Co., Limited -	G. Emmens.
106	Restormel - -	Iron -	Lostwithiel	Restormel Iron Mining Co., Limited.	*G. H. Taylor.*
107	Retallack, Great -	Zinc & Iron	Perranzabuloe, Truro.	Great Retallack Mining Co.	John Harris.
108	Rodd, Great Wheal	Tin - -	Uphill, Northill.	Great Wheal Rodd Silver-Lead Mining Co.	*R. J. Rutter* (liquidator).
109	Roskear, South -	Tin & Copper	Camborne -	South Roskear Tin and Copper Mining Co.	J. Hosking.
110	Roskear, West -	Tin, Copper, Lead, and Zinc.	Camborne -	West Roskear Mining Co. -	Hugh Stephens.
111	St. Aubyn United	Tin & Copper	Redruth -	St. Aubyn United Mines Co.	John Michell.
112	St. Austell Consols	Tin & Copper	St. Austell	St. Austells Consols Mining Co.	John Nicholls.
113	St. Breward Consols.	Copper -	St. Breward, Bodmin.	St. Breward Mining Co., Limited.	Thomas Dunn.
114	St. George - -	Silver-Lead	Tregear, near Launceston.	Broderick and Parker -	James Evans.
115	St. Ives Consols -	Tin & Copper	St. Ives -	G. Treweeke - -	G. Treweeke.
116	St. Just Amalgamated.	Tin -	St. Just, Penzance.	St. Just Amalgamated Mining Co.	*Richard Boyns.*
117	St. Neot Quarry -	Slate -	St. Neot, Liskeard.	Joseph Cocking - -	Joseph Cocking.
118	Seton, West Wheal	Tin & Copper	Camborne -	West Wheal Seton Mining Co.	W. Rutter.
119	Seymour, Wheal -	Zinc -	Chacewater	Nicholas Roberts - -	Nicholas Roberts.
120	Silver Vein - -	Copper -	Lostwithiel	Richard Hingdon - -	Peter Temby.
121	Sisters, Wheal -	Tin -	Lelant, Hayle	Wheal Sisters Mining Co. -	W. Rosewarne.
122	South Polmear -	Copper & Zinc	St. Austell -	Francis Barratt - -	Francis Barratt.
123	South Tolcarne -	Tin & Copper	Camborne -	South Tolcarne Mining Co. -	W. Rich.
124	South Wendron -	Tin -	Wendron, Helston.	South Wendron Mining Co.	Joseph Prisk.
125	Spearn Moor -	Tin & Copper	St. Just, Penzance.	Spearn Moor Mining Co. -	*E. Trythall.*
126	Tallack, Wheal -		St. Agnes -	Richards, Power, & Co. -	W. Vivian.
127	Tamping Quarry -	Stone -	Tuckingmill, Camborne.	Thomas Eudey - -	Thomas Eudey.
128	Terras, South -	Iron -	Grampound Road.	South Terras Mining Co., Limited.	J. H. James.
129	Tincroft - -	Tin -	Pool, Redruth.	Tincroft Mining Co. - -	William Teague.
130	Tincroft, New -	Tin -	Nancledrea, Penzance.	John B. Reynolds - -	Joseph S. Vivian.
131	Tolgus Consuls -	Copper -	Redruth -	The Tolgus Consuls Co., Limited.	W. C. Vivian.
132	Tolgus, West Wheal	Copper -	Illogan -	West Wheal Tolgus Mining Co.	John Hancock.
133	Treamble - -	Lead & Iron	Perranzabuloe	The New Perran Minerals Co., Limited.	James Henderson.

List of Mines—*continued.*

No.	Name.	Minerals raised.	Situation and Postal Address.	Owner.	Agent.
134	Trebeigh Consols	Lead	St. Ive, Liskeard.	Trebeigh Consols Mining Co.	John Gifford.
135	Treburgett, Old	Silver-Lead	St. Teath, Camelford.	Old Treburgett Mining Co., Limited.	William Hancock.
136	Treleigh Wood	Tin	Redruth	Treleigh Wood Mining Co.	*T. B. Laws.*
137	Tresellyn	Tin	Altarnun	Tresellyn Tin Mining Co., Limited.	*E. Mounsey* (liquidator).
138	Treskerby, North	Tin	St. Agnes, Scorrier.	North Treskerby Mining Co.	Martin George.
139	Trevaunance, Wheal	Tin	St. Agnes, Scorrier.	Francis Gilbert Enys	*G. C. Hancock.*
140	Trumpet Consols	Tin	Wendron, Helston.	Trumpet Consols Mining Co.	Richard Quentrall.
141	Unity Wood, Wheal	Tin	Scorrier	Wheal Unity Wood Mining Co.	*H. Michell.*
142	Uny, Wheal	Tin	Redruth	Wheal Uny Mining Co.	William Rich.
143	Violet Seton	Copper	Camborne	Violet Seton Mining Co.	John Nicholls.
144	Vor, West	Tin	Breage, Helston.	West Vor Mining Co., Limited.	Stephen Harris.

DEVONSHIRE.

1	Aller	Lead	Christow, Exeter.	The Aller Silver-Lead Mining Co.	*T. Watson Duncan.*
2	Bampfylde	Copper and Iron.	North Molton	Bampfylde Mining Co., Limited.	James Juleff.
3	Bedford United	Copper and Arsenical Pyrites.	Tavistock	Bedford United Mining Co.	R. Goldsworthy.
4	Belstone	Copper	Okehampton	Mid-Devon Copper Mining Co., Limited.	James Neill.
5	Buckland	Slate	Buckland Mounts, R S O	The Buckland Slate Quarry Co., Limited.	John Oldreive.
6	Brimley	Copper and Iron.	Molland	Molland Mining Co.	Henry Boyns.
7	Chillaton and Hogstor.	Manganese	Milton Abbot, Lew Down, R.S.O.	Sims Brothers	William Doidge.
8	Birch Tor	Tin	North Bovey, Post Bridge, Prince Town.	Birch Tor Mining Co.	Moses Bawden.
9	Combmartin	Lead	Combmartin	Combmartin Mining Co.	John Comer.
10	Combmartin, West	Lead	Combmartin	West Combmartin Mining Co.	John Treweek.
11	Courtenay, Wheal	Copper	Tavistock	Prout & Goldsworthy	John Goldsworthy.
12	Crebor, Wheal	Copper	Tavistock	Wheal Crebor Mining Co.	J. Andrews.
13	Dean Prior	Copper	Buckfastleigh.	Sir George Elliot, Bart.	Samuel Lake.
14	Devon Great Consols	Copper and Arsenic.	Tavistock	Devon Great Consols Co., Limited.	James Richards.
15	Eleanor, Great Wheal	Tin	Moreton-hampstead.	Great Wheal Eleanor Tin Mining Co., Limited.	W. H. Hosking.
16	Emily, The	Copper	South Tawton, Okehampton.	The Emily Mining Co.	M. E. Jobling.

List of Mines—*continued.*

No.	Name.	Minerals raised.	Situation and Postal Address.	Owner.	Agent.
17	Friendship, Wheal	Tin and arsenic.	Mary Tary, Tavistock.	Alfred Lanyon - -	Alfred Lanyon.
18	Florence - -	Iron -	North Molton	Florence Mining Co., Limited	Dudley J. C. Bush.
19	Frank Mills -	Silver-Lead	Christow, Exeter.	Frank Mills Mining Co. -	*John H. Hamley* (liquidator).
20	Fullabrook - -	Manganese	Braunton (Park Villas Barnstaple).	Joseph Pope - - -	Joseph Pope.
21	Gawton - -	Copper and Arsenic.	Gawton Quay, Tavistock.	James Hicky - -	George Rowe.
22	Haytor -	Iron -	Ilsington, Newton Abbot.	Haytor Magnetic Iron Ore Co., Limited.	*F. Warwick.*
23	Holne Chase -	Tin -	Ashburton -	General Malcolm - -	James Murray.
24	Kiln Close, King's Meadow and Brickfield.	Potter's Clay	Kingsteignton, Newton Abbot.	Brownes, Goddard, & Hatherly.	E. Goddard.
25	Kingsteignton Clay Mines.	Potter's Clay	Kingsteignton, Newton Abbot.	Watts, Blake, Bearne, & Co.	L. E. Bearne.
26	Lydford Consols -	Silver-Lead	Lydford, Bridestowe.	Samuel Mayne - -	Samuel Mayne.
27	Maria and Fortescue, West.	Copper and Arsenic.	Lamerton, Tavistock.	West Maria and Fortescue Consolidated Mining Co.	*Moses Bawden.*
28	Mary Hutchings, Wheal.	Tin and Arsenic.	Plympton -	Wheal Mary Hutchings, Limited.	Henry Miners.
29	Newton St. Cyres	Manganese	Newton St. Cyres, Exeter.	Sims Brothers - -	William Doidge.
30	Park Valley -	Silver-Lead	Bow, R.S.O.	The Park Valley Mining Co., Limited.	W. H. Hoskings.
31	Parracombe - -	Silver-Lead	Parracombe, Combmartin.	Parracombe Mining Co. -	*F. E. Young.*
32	Penn-Recca - -	Slate -	Staverton, Ashburton.	Owners of Penn-Recca Quarry	E. Steele Ford.
33	Ramsdown - -	Manganese	Milton Abbot.	George Seymour and Jacob Legassick.	George Seymour.
34	Russell, Wheal	Copper -	Tavistock -	The Wheal Russell Co. -	John Bray.
35	South Devon United (Brookwood and Wheal Emma).	Copper -	Buckfastleigh.	South Devon United Mining Co.	W. Hooper.
36	South Molton Consols.	Lead - -	South Molton.	South Molton Consols Mining Co.	*W. H. Watson.*
37	Steeperton Tor -	Tin - -	Belstone, Okehampton.	The Steeperton Mining Co., Limited.	S. Oldridge.
38	Stert - -	Slate -	Diptford, near Ivybridge.	W. R. Diggins - -	W. R. Diggins.
39	Tamar Valley -	Lead and Fluor spar.	Beerferris -	Tamar Valley Silver-Lead and Fluor spar Mining Co.	R. Goldsworthy.
40	Teignbridge -	Potter's Clay	Kingsteignton	Whiteway and Co. - -	John Mallett.
41	Teign Valley -	Barytes -	Bridford, Exeter.	Teign Valley Lead and Barytes Mining Co., Limited.	James Rowe.
42	Vitifer, East	Tin - -	North Bovey, Moretonhampstead.	East Vitifer Tin Mining Co., Limited.	*W. D. Mann.*

List of Mines—*continued.*

No.	Name.	Minerals raised.	Situation and Postal Address.	Owner.	Agent.
			SOMERSETSHIRE.		
1	Brendon Hills	Iron	Brendon Hills.	The Ebbw Vale Steel, Iron, and Coal Co., Limited.	Henry Skewis.
2	Lower Thorne	Iron	Exford	John H. Miles	John H. Miles.
			DORSETSHIRE.		
1	Furzy Ground	Potter's Clay	Wareham	W. J. Pike	L. W. Pike.
2	Kimeridge	Cementstone	Kimeridge, Smedmore, Wareham.	Col. Mansel	Col. Mansel.
3	Seymour's	Potter's Clay	Branksea	The Branksea Island Co., Limited.	R. H. Fry.

DORSETSHIRE.

PURBECK STONE MINES.

No.	Name of Owner or Occupier.	Situation.	Postal Address.
1	*Benfield, Richard	Turnpike	Langton, Swanage.
2	Benfield, Seth and Joseph	Eastington, Great Cowlease (Worth).	„ „
3	Bonfield, Geo.	Leason Farm	Court Hill, Swanage.
4	Bonfield, Joseph	Herston Farm	Herston, Swanage.
5	Bonfield, J. W.	Belle Vue Farm	„ „
6	Bower, Chas.	Eastington, Great Cowlease, Worth.	Langton, Swanage.
7	Bower, Fred.	Court Ground	Court Hill, Swanage.
8	Bower, George and John	Eastington Farm	Langton, Swanage.
9	Bower, Henry and James	Eastington	„ „
10	*Bower, Isaac	Langton	„ „
11	Bower, Isaac Browne	„	„ „
12	Bower, Isaac and Seth	Wilkswood Farm	„ „
13	Bower, Isaac and Stephen	Langton	„ „
14	*Bower, Jeremiah	Sheepslight	Worth, Wareham.
15	*Bower, Jesse	Langton	Langton, Swanage.
16	Bower, Job	Acton	Acton, Langton, Swanage.
17	Bower, John	Langton	Langton, Swanage.
18	Bower, John White	West Highlands	Turnpike, Worth, Wareham.
19	Bower, Martin	Eastington, Cowlease, Worth	Acton, Langton, Swanage.
20	Bower, Thomas, No. 1.	Leason Farm	Combe, Langton, Swanage.
21	Bower, Thomas, No. 2.	Langton	Langton, Swanage.
22	*Bower, Thomas B.	Eastington, Cowlease	„ „
23	*Brown, Eliza	Leason Farm	Herston, Swanage.
24	Brown, James	Court Farm	„ „
25	*Brown, Timothy	Langton	Langton, Swanage.
26	Brown, Walter	Herston Farm	Combe Lane, Swanage.
27	Burt, George	Court Farm	Court Hill, Swanage.
28	Burt, W. and J. Manwell	Langton	Court Hill, Swanage.
29	Chinchen, George and Wm.	Eight Holds	Swanage.
30	Chinchen, John	Highlands, Worth	Langton, Swanage.
31	*Collins, Isaac	Court Farm	Swanage.
32	Collins, James	Herston Farm	„
33	Collins, Richard	Belle Vue Farm	Herston, Swanage.
34	Collins, Samuel	Swanage	Swanage.
35	Collins, Walter	Belle Vue Farm	„
36	Collins, Wm.	Rusbres	„
37	Collins, Wm.	North Field	„
38	Cooper, H. and G.	Landshard	Clarence Cottage, Swanage.
39	Cooper, John	Combe Farm	Herston, Swanage.

* The asterisk before the name denotes that the owner or occupier did not work his quarry in 1878.

DORSETSHIRE—*continued*

PURBECK STONE MINES—*continued.*

No.	Name of Owner or Occupier.	Situation.	Postal Address.
40	Cooper, Michael	Herston Farm	Herston, Swanage.
41	Corben, Alex.	South Highlands	Langton, Wareham.
42	Corben, Charles Holt	French Grass Ground	Acton, Swanage.
43	Corben, Geo.	Eastington Farm, Worth	,, ,,
44	Corben, Michael	Herston Farm	,, ,,
45	Curtis, Thos.	Little Cowlease	Langton, Wareham.
46	Hancock, Henry	Herston Farm	Herston, Swanage.
47	Harden, Geo.	South Barn Farm	Swanage.
48	Harris, Albert	Newton Farm	Herston, Swanage.
49	Harris, Alfred	Langton	Langton, Wareham.
50	Harris, George	Belle Vue Farm	,, ,,
51	Harris, George (Gate)	Townsend Farm	,, ,,
52	*Harris, Thomas	Townsend Farm	,, ,,
53	Haysom, Francis	South Barn Farm	Swanage.
54	Haysom, Henry	Herston	Herston, Swanage.
55	Haysom, Isaac	South Barn Farm	Ashler Row, Swanage.
56	Haysom, Stephen	Townsend Farm	Swanage.
57	Haysome, Fred.	South Barn Farm	High Street, Swanage.
58	King, Joseph	Belle Vue Farm	Court Cottage, Swanage.
59	Lander, George	Worth	Worth, Wareham.
60	*Lander, J. and Samuel	West Highlands, Worth	Langton, Wareham.
61	Manwell, Peter	Herston Farm	Swanage.
62	Norman, Frank	,,	Court Hill, Swanage.
63	Norman, Geo.	Court Farm	Herston, Swanage.
64	Norman, James	Townsend Farm	High Street, Swanage.
65	Norman, James Kempster	South Barn Farm	Swanage.
66	Norman, Joseph	Court Farm	Herston, Swanage.
67	Norman, Robert	Eight Holds Farm	Church Hill, Swanage.
68	Phippard, Chas.	Belle Vue Farm	,, ,,
69	Phippard, John	Worth	Worth, Wareham.
70	Phippard, Samuel	Newton Farm	Herston, Swanage.
71	*Randell, Emily A.	Woodyhide, Worth	Swanage.
72	Saunders, John	Purbeck Field	Langton, Swanage.
73	Saunders, Wm.	St. Thomas' Field	,, ,,
74	*Serrell, Francis	Dry Mead	Dumford, Langton, Swanage.
75	Seymour, Henry	Court Farm	Church Hill, Swanage.
76	Seymour, Joseph	Belle Vue Farm	Herston, Swanage.
77	Shott, George	Herston Farm	Swanage.
78	*Squibb, Robert	Worth	Langton, Swanage.
79	Squibb, Samuel	Swanage	Swanage.
80	Squibb, Thomas	,,	,,
81	Stevens, Thomas	Twitchens	Herston, Swanage.
82	Stevens, Wm.	South Barn Farm	North View Cottage, Swanage.
83	Stickland, Isaac	Leason Farm	Herston, Swanage.
84	Stickland, John	Swanage	Swanage.
85	*Stickland, Robt.	Head	Church Bridge, Swanage.

* The asterisk before the name denotes that the owner or occupier did not work his quarry in 1878.

DORSETSHIRE—*continued.*

PURBECK STONE MINES—*continued.*

No.	Name of Owner or Occupier.	Situation.	Postal Address.
86	Tomes, Henry and Walter	Belle Vue Farm	Swanage.
87	Tomes, Isaac	Swanage Field	Ashler Row, Swanage.
88	Tomes, John	Belle Vue Farm	Swanage.
89	Tomes, Richard and Frank	"	Court Hill, Swanage.
90	Tomes, Wm.	"	" "
91	Turner, Frank	Cowlease Court Farm	Summer Lane, Swanage.
92	Vye, Wm.	Gallowsgore	Worth, Swanage.
93	White, N. C.	Eight Holds Farm	Swanage.
94	White, N. C.	Court Farm	"

* The asterisk before the name denotes that the owner or occupier did not work his quarry in 1878.

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ABERCARNE COLLIERY EXPLOSION INQUEST.

589

RETURN to an Address of the Honourable The House of Commons, dated 12 March 1879;—*for*,

"COPIES of REPORT of the COMMISSIONERS sent down by the GOVERNMENT to watch the ABERCARNE INQUEST:"

"And, of the EVIDENCE given before the CORONER."

Home Office,
17th March 1879.

MATTHEW WHITE RIDLEY.

(*Mr. Macdonald.*)

Ordered, by The House of Commons, *to be Printed,*
18 *March* 1879.

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ABERCARNE COLLIERY EXPLOSION.

REPORT by Mr. *Thomas Cadman*, Inspector of Mines.

Sir, Lydney, 30 January 1879.

IN compliance with the Home Office note (No. 77,262—26) herewith enclosed, I have the honour to report to you upon the Abercarne Colliery Explosion, which occurred on the 11th September last, and by which 267 lives were lost. At the time of the accident I was within two miles of the colliery, and was sent for immediately it happened, so that I was down the pit within an hour of the explosion. Unfortunately, the timber and coal had taken fire in several places near the shaft bottom, and at least at one point some distance from the pit.

The roof had also fallen very heavily, and a large portion of the workings were full of gas. Everything that was possible was done to extinguish the fires and get into the workings, but the explorers after being down for five or six hours were beaten back by gas and fire upon all sides, and then ascended the shaft for consultation on the surface.

The pit was not left, however, before it had been ascertained that no one could be alive in the workings. At this time I expected a second explosion every moment, as fires were raging at the bottom of the shaft, and the gas was coming out so strong that it would fire at the top of the pit. As the fires continued to rage, vast masses of black smoke coming up the up cast pit, it was determined by the engineers present, as the only safe method, to flood a portion of the mine and so extinguish the fires. This was commenced the next morning, and it was some weeks, after getting out the water again, before we were able once more to descend and commence afresh exploring operations. I may say here, that the water did not reach many of the bodies, as will be seen by reference to the accompanying map, where the water-line is shown.

Nearly the whole of the bodies are in the working places, indicated by small numbers in each district on the plan, the reference upon which gives each person's name, showing the place where his body is supposed to be lying. The district marked No. 2 was comparatively uninjured by the explosion, and all the men working there escaped, but no one came out alive from any other. When the bottom of the shaft was reached after the water had been taken out repairs were immediately commenced, and everything done to reach the bodies of the unfortunate men as quickly as possible. The roadways were cleared night and day, and matters progressed, although slowly, yet apparently surely, until, as I reported to you at the time, the Ebbw Vale Company were compelled, as they stated, through want of means, to stop all operations underground, and now they are simply keeping the pumping engine at work, so as to prevent the mine filling with water.

The road coloured blue, marked "No. 4, Dukey-road, engine-plane," on plan, was cleared for a distance of about 520 yards from the shaft, and the return air-way, coloured red, nearly parallel to it, not quite so far.

The roads on the other side of the shaft marked "Main Dukey-road, engine-plane," and "Main Return," on plan, were cleared not quite 400 yards.

I made very careful examinations of the underground roads as they were cleared from time to time, and everything pointed to the 21 district as the seat of the explosion. Indeed, I think this is evident, and with the exception of one collier, every witness at the inquest appeared to be of that opinion. A very

careful inquiry was held by Dr. Brewer, the coroner, assisted by Mr. Wheelhouse, Q.C., who was sent down by the Home Office, and lasted 23 days, when the following verdict was returned:

"John Hall met his death by an explosion of gas in the Prince of Wales' "Pit, Abercarn; but how it occurred we have no evidence to prove."

Many of the witnesses spoke of gas having been seen in the No. 4 district on the Friday, Saturday, Sunday, and Monday previous to the explosion, when a "squeeze," or settling down, of the roof occurred in a portion of that district, and some falls took place; but others declared that the quantity of gas was comparatively small, and that prompt measures were taken to make the place safe, and that before the Wednesday (the day of the explosion) everything was in working order again.

I met the manager of the colliery on the morning of the accident before it happened, when he told me of the "squeeze" in No. 4, and that some gas had been given off, but that all was then safe and clear.

Gas was also seen at different times in other parts of the mine from time to time, but I think I may safely say that the Abercarn Colliery was about the most fiery pit that I have ever had anything to do with, and without ample ventilation in all its parts, and the most careful attention to all matters connected with the ventilation, danger would quickly arise. The 21 district was spoken of as the warmest portion of the colliery, and upon a few occasions gas was seen in the working places, but it invariably appeared that when this occurred the officers of the mine withdrew the men, and took the necessary steps to clear the places before the colliers were allowed to re-enter.

Until lately the colliery was worked upon a system known as double stall. Openings were driven in the coal about 16 yards wide, taking two roads, one at each side, as shown upon the rough sketch section marked A. The space between the roads was sometimes only partially filled, and when these stalls had been driven up about 60 yards the place was abandoned, and the two mouths of the openings filled up as tightly as possible with the spoil or rubbish.

About two years ago the system of working was, however, changed to long work, by which means all the coal was wrought, with the exception of about 3 feet, left up as a roof. Thus it was thought that less space would be left open in the old workings for any accumulation of gas, and also that the mine would be better ventilated.

There were, however, a few places spoken of in evidence which had been bashed or stowed off in the long work, and which were not altogether filled. Nevertheless, considerable currents of wind passed along the roads outside these stoppings. In addition to the resident certificated manager at Abercarn, the Ebbw Vale Company employed a certified manager, who had the general supervision of all their mines, visiting them all from time to time, and checking the other managers. Mr. Higson, mining engineer, of Manchester, also acted as consulting engineer, and I believe was in Monmouthshire about once a month, inspecting Abercarn at most of his visits.

Some few years ago the general ventilation of the colliery was not considered satisfactory, when it was determined to sink a third shaft for the purpose of improving it.

This was done, and the communication with the workings was only completed last April. This pit is shown upon the plan marked "Cwmcarn Pit," and is sunk to a depth of about 250 yards, being a round shaft 20 feet in diameter.

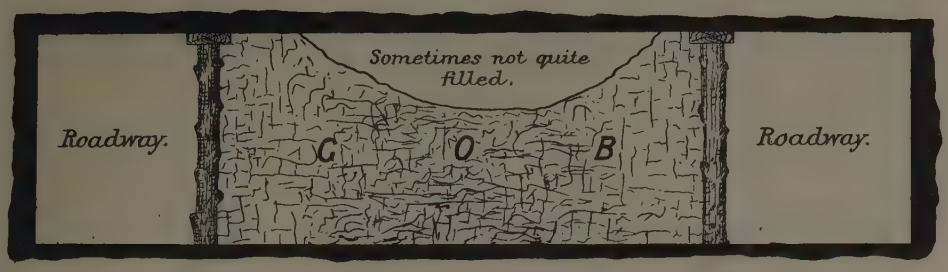
In my opinion this would have been better arranged as an up-cast or outlet for the air after passing through the workings, but when this was mentioned some time ago I was told that the engineers had decided for the present to make it a down-cast, taking in fresh wind there, joining a current from another pit, and passing to the old up-cast.

Of course the cost would have been considerably increased by erecting a ventilating apparatus at the top of the Cwmcarn Pit, and reversing the air currents, but as that is the higher shaft it would have been the natural outlet. Nevertheless, when the Cwmcarn pit was completed the quantity of wind passing through the workings was increased from 90,000 to 135,000 cubic feet per minute, with the arrangements made, and fresh air was introduced in the working faces. Only one seam of coal was worked, and this quantity was distributed in the workings in that seam.

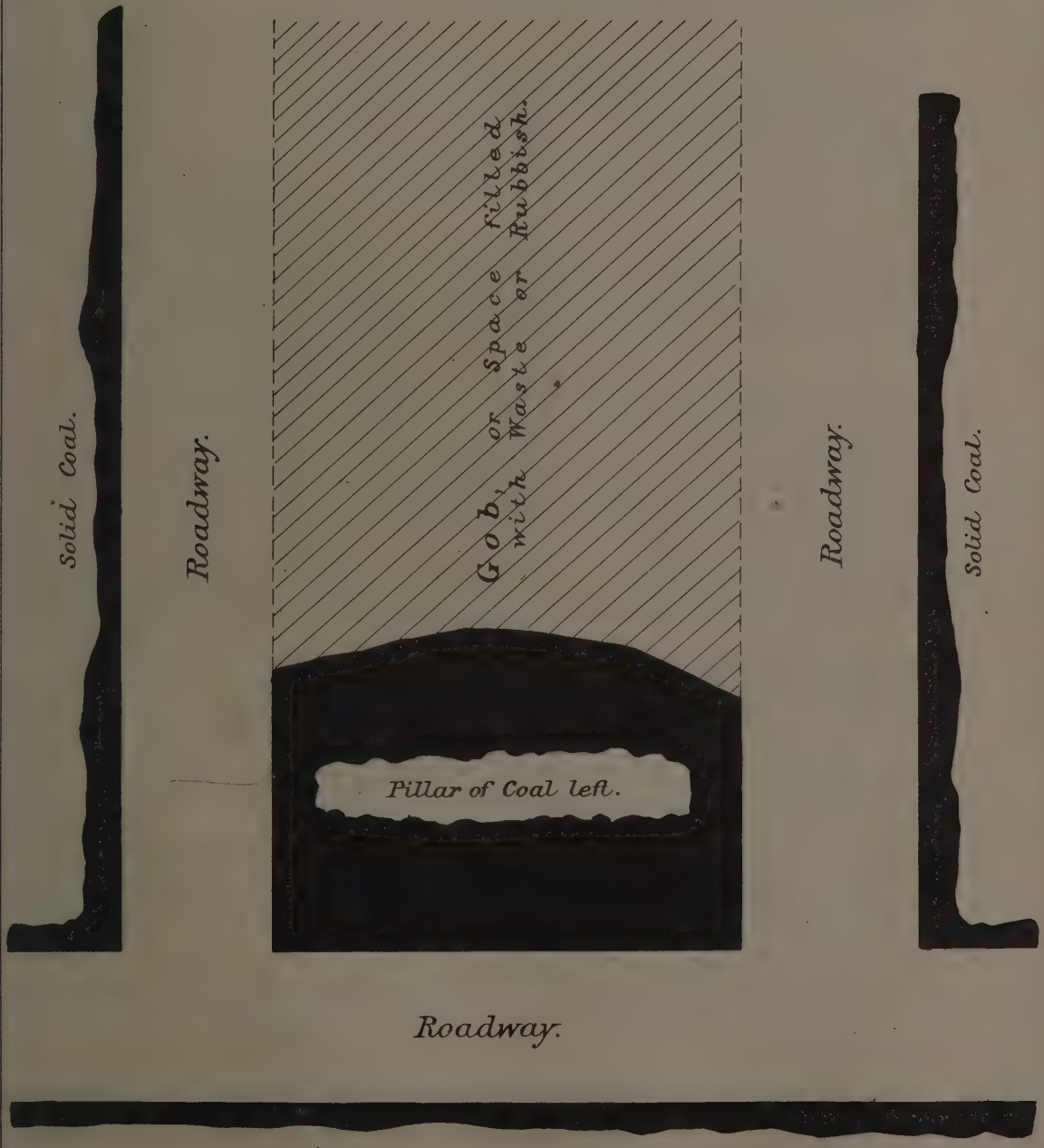
It

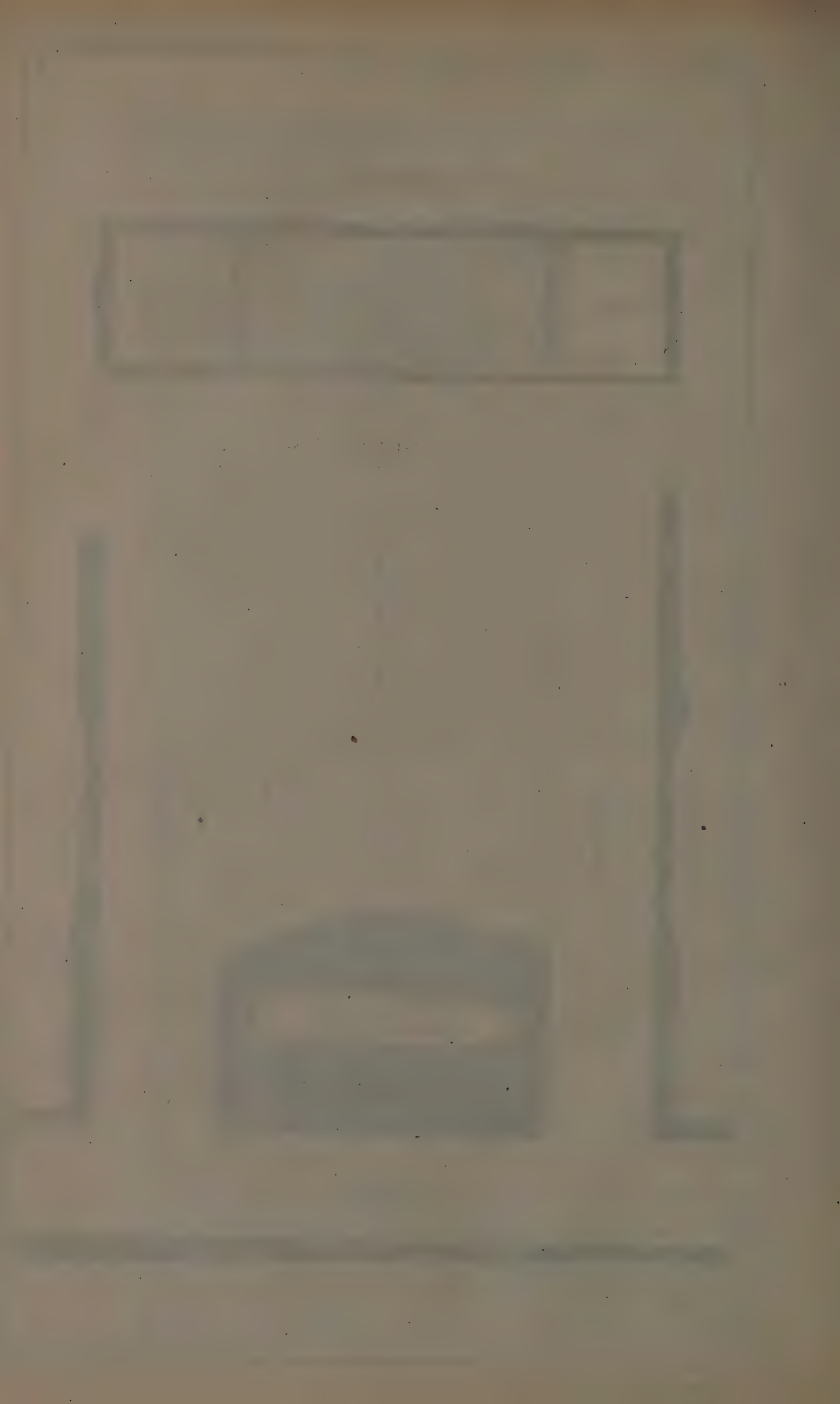
A.

SECTION.



PLAN.





It will be noticed that the 21 district was the furthest away from either of the down-cast pits, and therefore the most difficult to ventilate. The last time that I inspected that district was in March last, when I failed to detect the presence of gas, and all appeared in fair order.

It will be observed that this was before the completion of the roads connecting the workings with the Cwmcarn Pit, and therefore when there was less wind passing through the colliery than afterwards. Both my assistant and myself have been into the mine since then upon several occasions. I made an inspection chiefly in the return air-ways on the 12th August, one month before the explosion, when they were in a better condition than I had ever seen them in before.

My assistant after his inspections has invariably reported finding the place free from gas as far as he observed. The mine was worked by three shifts of men, two shifts cutting coal and one repairing. Where it can be avoided I think it is objectionable to have one shift of men following another into their working places without allowing any space of time to intervene, especially in a very fiery mine. The places have to be examined when men are actually in them before one turn goes in. Nevertheless at Abercarn there were several overmen and firemen in each district, so that all places were usually examined by an official several times each night and day. With regard to the verdict found by the coroner's jury, under the circumstances I think it would have been difficult to have arrived at any other.

The only definite conclusion which they could come to from the evidence was that an explosion had occurred, and that it originated in the 21 district, but it was stated to be free from gas on the morning of the explosion, and as no one has been able to examine that part of the colliery since the accident happened it is impossible to determine whether any indications exist there which might throw some further light upon the matter. I very much regret that the whole of the mine has not been re-opened.

I stated my opinion before the coroner that some derangement occurred in the ventilation of the district where the explosion happened, and gas was thereby allowed to accumulate, which it would do in a very short time, and fired at one of the so-called safety lamps in use; the lamps are those generally used in Monmouthshire and South Wales.

The mine was very dusty, and to this fact I attribute the disaster extending over nearly the whole of the colliery. The coal worked at Abercarn is more bituminous than most of the Welsh steam coals worked, and the fine dust upon the roadways at a higher temperature would increase the explosive mixture, and therefore add to the force of the explosion immensely, carrying the fire far beyond the limits to which it would have reached if simply the mixture of fire-damp and air had been ignited.

Blasting was strictly prohibited in the mine, and excepting at the one lamp station in the mine, and at the bottom of the down-cast pit, all lamps were kept carefully locked.

It appears that in years gone by large and sudden outbursts of gas have occurred in the colliery, completely filling the workings with an explosive mixture, and the managers believe that such an outburst must have occurred in the 21 district on the 11th September.

I, however, think that some derangement of the ventilation occurred allowing the air to pass into the return ways before passing through the faces, and gas accumulated.

When this was ignited it was fed by the dust upon the roads, and any gas which might have been in any of the old workings, and so extended over the whole pit with the exception of the No. 2 district, which was completely isolated om the others.

I am, &c.

The Right Hon. R. A. Cross, M.P., Home Office.

(signed) *Thos. Cadman.*

FIRST REPORT by Mr. *Wm. St. J. Wheelhouse*, 20 September 1878.

REPORT of the PROCEEDINGS at an ADJOURNED INQUEST, held at the Crown Inn, Abercarn, Monmouthshire, on Thursday, 19th September 1878, before *W. H. Brewer*, Esq., CORONER, upon the Body of *John Hall* (Deceased).

2, Crown Office-row, Temple,
20 September 1878.

Sir,

I HAVE the honour to inform you that in pursuance of the instructions forwarded to me, I attended the adjourned inquest on the above-named case.

I append a copy of my notes of the evidence and proceedings, omitting, however, the names of the jury.

At the opening of the proceedings the Coroner referred to a letter said to come from the Miners' Association, who desired to put questions; the Coroner saying that any person seeking to do so must either do it through a professional man, or through himself, whereupon Mr. Davis, on behalf of the Association, said they quite agreed with that suggestion, and would employ "a practical barrister."

The Coroner further explained that he only proposed, at this sitting, to take sufficient evidence to open the inquiry, and to deal with matters of necessity, seeing the present state of the pit. He, therefore, found it absolutely necessary to adjourn for some considerable time, perhaps a month, or even more, so that it was not desirable, to-day, to go into any cross-examination, as facilities would be afforded, afterwards, for *that*, adding (addressing Mr. Davis) that "when the inquiry is resumed, if you think proper or convenient to do so, you can then put your questions through me, and if I consider them proper ones, I will do my best to obtain an answer for you."

Mr. *Hale* (District Serjeant of Police) informed the Court that great care had been taken not to have any person on the jury who was connected either with any of the deceased miners, or with the Abercarn Colliery.

Mr. *J. E. Ward* said he was the solicitor of the company, and appeared for it.

Mr. *Wheelhouse* said he was there by instructions from the Home Office and the Treasury, in order that he might observe the progress of the inquiry, with a view to any necessity for examination or cross-examination that might arise.

James Partick was then called, and sworn.—I am a mining engineer, and live at Basseleg. I arrived in Abercarn on Wednesday, the 11th instant, about 5.40 p.m. I went to the pit. As I arrived I saw a corpse brought up to the bank. I did not know the deceased. I saw Mr. Cadman, Mr. Green, and Mr. Bain, who came up with several others, some of whom I knew, some strangers to me. Mr. Pond came up and spoke to me. He said, "It is a sad affair, this." I asked him, "How things look below"? He said, "Come with me, I want you, and I will let you know." He said, "Give me all the assistance you can;" and I said, "Yes, by all means." We walked together to the Commercial Inn. When I got there I found Mr. Cadman, Mr. Bain, Mr. Green, and several others; some I knew, some I did not. Mr. James (of Abersychan) was there. We immediately commenced deliberating upon what was to be done. We came to the conclusion that it was no good attempting to penetrate the Abercarn pit, or to explore any further, as they met with gas in the Dukey-road, and found the place smothering in smoke about the cross-hole, at a distance of 400 yards from the shafts. It was decided, then, to go to the Cwmcarn pit, for as that was the down-cast, therefore, if there were any people living they would be *there*. Mr. Pond, and a number of explorers with him, started about eight o'clock p.m. for the Cwmcarn pit. We arranged that we should receive a message from him every half-hour. Mr. Cadman, myself, Mr. Bain, and Mr. Green, stood at this end waiting for the message, we stopping at the Abercarn end. We kept watching the steam and smoke coming up the up-cast shaft, as to whether it increased or decreased up the up-cast. We waited three hours for the message, and we feared, as they had been gone so long, that something had happened to them. Then two horsemen were sent to Cwmcarn, but before they returned a dense volume of smoke came

came up the up-cast shaft, and we then saw that the pit was on fire. Then we despatched a messenger, telling him to go as fast as he could to tell them to come from there as the pit was on fire; then they all returned in safety, and we deliberated as to what we were to do. We were anxious, but Mr. Cadman hesitated about drowning the pit, but we could see no other course open to us, Mr. Cadman hoping that there might be some other mode of getting at the people, or the bodies in the pit: but after long consultation, we decided upon drowning the pit as the only means of putting out the fire. We turned the water in at 1.30 a.m. on Thursday. It was running in till three o'clock p.m. last Monday, continuing to run in for 116 hours, and then it was stopped, because we were unanimous that, by that time, the fire was put out, for the water was many feet above the fire. There were 54 feet of water in the shaft. I saw the first party of explorers come up, but I did not see them go down; they came up because they thought the return-road was on fire. There were heavy falls all about, and they could see smoke coming through them. This is what I heard, not being down the shaft myself. In my opinion it will be more than a month before it will be safe for any people to go down to explore the pit, even if they were to start pumping to-day, in consequence of the body of water that has been let in, and the power and appliances, on the other hand, they have for getting it out.

By Mr. *Ward.*] I am an engineer and a colliery proprietor in this district and in Glamorganshire.

By Mr. *Wheelhouse.*] I should like to know whether, in your opinion, any additional facilities can be put up for pumping out the water, or the recovery of the bodies, earlier than you mention.

Mr. *Partick.*] I do not think there are any additional facilities that can be made available. There are 34,800,000 gallons of water in the pit, and if everything goes on straight it will take 25 days of continuous working; but it may be that after a month there may be a chance of getting at some of the bodies. When this water is unroofed we hope to get down by way of Cwmcarn.

David Bowen (sworn). I am cashier of the Abercarn Colliery. On the day of this accident (Wednesday, the 11th) I was there. There are 264 dead. I cannot say how many were hurt. There were 93 rescued, but not all of them *well.* Six out of that 93 have died since the rescue, but they are included in the number I first gave, namely, 264. There were 372 lamps given out that morning, but some hitchers would have no lamps, and some would have two. One man's lamp had been given out the day before, and had not been returned; one of the Watkins's.

Mr. *Thomas Cadman* (sworn). I am Inspector of Mines for this district. I happened to be at Risca on the morning of the explosion, and Mr. Pond, the manager of the Abercarn Colliery, had come down there to meet me about some alteration in the special rules of the Abercarn Colliery; I had just left Mr. Pond, when a man came running after me and said the Abercarn pit has fired. I hastened up to Abercarn as quickly as I possibly could. I found Mr. Pond had just gone down the pit; he had had a little start of me; and I and Mr. Bain (who was with me) immediately went down the pit as quickly as we could. The cage in which we were could not get to the bottom of the pit in consequence of the timber being blown about by the explosion; but by means of a ladder we got down to the bottom of the pit. When we got there we found a number of men there out of the workings, waiting to come up. After a few minutes of examination at the bottom we went on into the main return, where all the timber was on fire and blazing. I found Mr. Pond at the point where the fire was, and we all worked away to try to put it out with buckets. We then sent up the men who were with us, as we expected a second explosion every moment from the state of the pit. After further examining the mine for about (I suppose) 400 additional yards we saw evidence of several other fires, and large bodies of gas. We then came up to consult—as the former witness, Mr. Partick, has told you—as to the best means of putting out the fires, saving lives, and the workings, and taking the best steps we could. No practical good can be done, or any further investigation be made, till the lapse of at least four weeks from to-day.

By the *Coroner.*] I believe there is to be a meeting to-day of engineers, both from the north of England, Glamorganshire, and Monmouthshire, to determine whether they will begin pumping out immediately.

[Adjourned till Thursday, 17th October, at 10 a.m., at this place.

Beyond this, and in order that I might be better able to elicit the facts of the case, and the true cause of the accident, if possible, I took the following course, principally for subsequent use and reference.

I began my investigation by going through the village of Abercarn, which is beautifully situate in the valley of the Ebbw, some 10 or 12 miles from Newport, whence there is a railway direct to the village.

It must be understood, however, that in doing this, I had no talk or communication with anybody; merely visiting the place alone, and making my own observations on what I saw.

The population is composed pretty nearly, if not wholly, of miners, most of whom are colliers, though there are some tin works also, of an extensive character, which give employment to some portion of the people.

The colliery of Abercarn and the pit are held on lease from Lady Llanover by the Ebbw Vale Company, the local manager for the latter being Mr. Pond.

The works are very large, situate under the Knock Mountain, and consist of some old workings, now for the most part exhausted, and the proprietors are, at present, working on a new driftway, towards the head of Cwmcarn, a side valley a little to the right of Abercarn.

The Company has driven a new shaft at the head of the Valley of Cwmcarn, down to the levels of the working which run for exactly two miles under the Knock; the distance from the Abercarn Shaft to that at Cwmcarn, over the surface, by the road down the Abercarn Valley and up that of Cwmcarn is between two and three miles.

After the adjournment of the inquest I went up the Cwmcarn Valley to the new shaft, so that I might make myself acquainted, not only with the face of the country, but so far as possible, with all the operative details on the surface.

On arrival at Cwmcarn, I found, as I expected I should find, the shaft there closely stopped up with a wooden floor, covered first with a tarpaulin, and then with a thick layer of sods. The only exception was in the case of a test-pipe or tube, of about 12 inches in diameter carried from the drift level below up to the surface, in order to ascertain, from time to time, alike the temperature, and the clearance, or otherwise, of escaping gas. When we took the safety lamp near the orifice of this tube, and held it at a distance to be absolutely safe, we could still perceive gas pouring out in very dense volumes, so much so, indeed, that although the surrounding mountain air was beautifully fresh and free, I thought I could clearly smell the fumes as they came out, and it is abundantly evident that some considerable time must necessarily elapse before this gas is sufficiently expelled to render the shaft free from danger so far as exploration is concerned.

I also took the opportunity of inspecting the underground plan of the workings, and I found them to consist of an up-cast and down-cast shaft at Abercarn, and the new shaft (scarcely yet in operation) at Cwmcarn.

Below ground the main drift-lines were in the form of the letter *L*, as in the diagram opposite, the point A. representing the Abercarn end, B. that of Cwmcarn, the actual "winning" and "pillarage" for support being chiefly represented by the crosslines // and dotted lines ⋮ respectively, though the proprietors have, apparently, more recently, began to open longitudinal (as distinguished from the former cross) lines of "winning."

There are two or more policemen stationed at the Abercarn mouth, and one, at least, at the Cwmcarn end, to guard against trespassers, and to be on the watch generally; indeed, every possible precaution against unforeseen danger seems to have been most sedulously taken.

The ventilating fan at the Abercarn end is kept going at about 12 or 14 revolutions a minute, in order, so far as possible, to purify the air in the shaft.

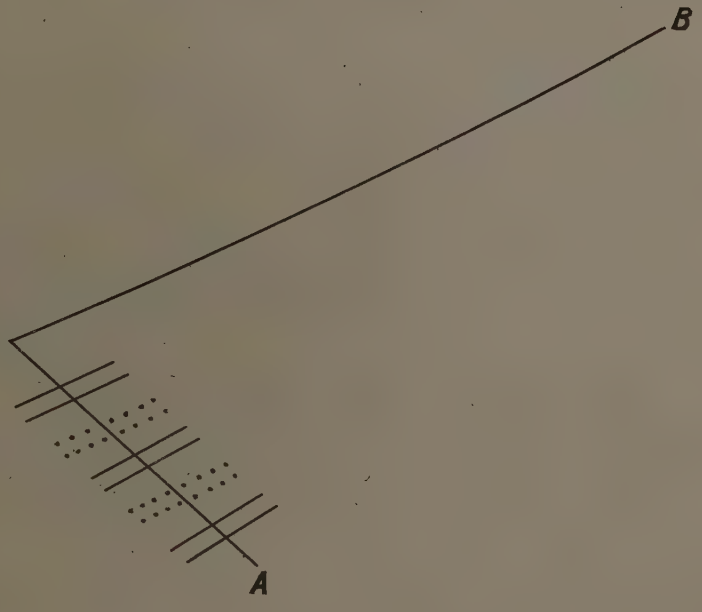
The engines and machinery for lowering and bringing up the men, raising the coal, pumping, and ventilation, all seem to have been in good working order, so far as can be judged of it above ground, one of Robey's best engines being in use at the Abercarn end.

A consultation of engineers and practical men was held on Thursday the 19th, at which I understand it was determined that the proper course would be to commence pumping the water out again immediately, and that step will, I believe, have been already adopted (20th).

The personal misery of the survivors (being as they mostly are), women and children, is unspeakably lamentable, but every one in the district is vying with each other in the endeavour to mitigate and relieve individual and physical temporary distress; but so far as money, *merely*, can ever afford relief in such a case (and the necessities must increase now the wages have ceased, and *winter* is approaching), it will require an enormously increased sum beyond the amount of the present subscription, large and generous as that already is, and promises to be, in order to repair the loss caused by this terrible calamity.

I have

DIAGRAM.



I have to add that of the number who died, it is stated that there were 131 married, and 68 unmarried men, four widowers, 55 youths and boys under 18, while the dependent relations are besides the 131 widows, nine parents, 17 brothers and sisters, and the enormous number of no less than 360 children.

It is, however, most gratifying to be able to say that awful as the circumstances are, I did not hear even the murmur of complaint against anybody, living or dead, up to this time.

I cannot close this report without adding that some of the instances of personal bravery, kindness, and devotion to duty which have, though of course as yet only incidentally, been brought to my knowledge are beyond all praise, and are, at least in my experience, almost unprecedented, though they have not come, officially, before the jury.

I have, &c.
(signed) *Wm. St. J. Wheelhouse.*

To the Right Hon. the Secretary of State,
Home Department.

SECOND REPORT by Mr. *W. St. J. Wheelhouse*, 1st February 1879.

Adjourned Inquest on the Body of *John Hall*, a Miner.

2, Crown Office-row, Temple, London,
1 February 1879.

Sir,

1. In supplement of my previous communication, dated on the 20th of September last, I have now the honour of forwarding the following Report of subsequent proceedings :—

2. After the adjournment in September there were two succeeding ones, the first to the 17th of October, the second to the 18th of November.

3. At neither of these was there anything done, with the exception that, at the November meeting, a report signed by Mr. Robert Jordan, the local manager of the Ebbw Vale Company (Limited), was placed in the hands of the Coroner.

4. It will be remembered that as the result of a decision unanimously arrived at by those called upon to express an opinion as to what was best to be done, "the Prince of Wales' Pit," where the explosion occurred, had, though with great reluctance and after much consideration, been inundated by turning the water of the River Ebbw into it.

5. The line of that inundation is shown on the plan appended to this Report, and being no less than 50 feet deep, flooded all the workings in the neighbourhood of its course, thereby necessarily, and at any rate temporarily, putting an end to all the operations of the pit.

6. I think it better to insert a copy of the report I have mentioned here, because, chronologically, it accounts for the position of affairs from the time of the catastrophe until the date of the report itself.

7. It is addressed to the Coroner, and is as follows :—

"Sir,

"Relative to our efforts since the adjournment of the inquest on the 17th of last month, to enter and explore the colliery for the recovery of the bodies, &c., I beg to make the following statement, viz., at that time there was a depth of 20 feet of water above the flooring plates at the pit bottom.

"By continual winding at Nos. 1, 2, and 3 pits, the water was reduced to within 18 inches above the plates in the first instance.

"We then tried to start the pump, but owing to the cistern of the bottom forcer being choked with iron, stone, and débris of all kinds, could get no water. We then continued winding until the water had been lowered two feet under the flooring plates, beyond which points the tanks failed to reduce it.

"We then sent to Newport for divers, who were kindly spared to us by Admiral Foote.

"This was on the evening of the 6th instant (November), and by continual exertion up to the morning af the 8th (Friday) they succeeded in clearing out the cistern, when the pump was at once started, and by Saturday morning, the 9th instant, the writer and others were lowered sufficiently to enable us to recover from the sump the bodies of Henry Golding, John Beak, Nathaniel Jones, and Thomas Tyler.

"Since then we have been continually employed in clearing up and restoring the roadways and levels at the pit bottom, and have now reached large falls on all sides.

"These falls, which we have met with in every direction from the bottom of the shaft, render the progress of the mine very slow and difficult, and, so far as an opinion can be formed, the task of recovering the bodies must be a tedious one.

"There is at present no possibility of any examination of the pit being made to determine the cause of the explosion, though since the last adjournment of the inquest, neither labour, skill, nor due expenditure of money have been spared by the Ebbw Vale Company (Limited), their officials, and men, to effect this.

"Seeing the difficulty of opening the workings from the Abercarn pits, and being unable to send to, or bring air from, Cwmcarn Pit, a feature indicating the fallen nature of the roads, a ventilating fan to expedite the re-opening of the colliery will be immediately set to work at Cwmcarn Pit, and hopes are entertained that some part of the pit may be re-opened from there, and the bodies now lying in that district will be brought to that shaft.

"18 November 1878. (signed) "*Robert Jordan.*"

8. The inquest was practically resumed at the Crown Inn, Abercarn, before Mr. Brewer, on the 16th December last, when the jury having been called over and re-sworn, proceedings were recommenced.

9. According to my instructions, I attended the inquest during the subsequent sitting of every day until all the evidence had been placed before the jury.

10. Mr. Ward, solicitor, of Newport, again attended on behalf of the Ebbw Vale Company, and Mr. Walter Morgan, solicitor, of Pontypridd, appeared for Charlotte, the widow of Wm. Simmonds (one of the deceased miners), and others, as well as for the miners of South Wales.

11. Mr. Wales and Mr. Cadman, District Inspectors of Mines, were also present at the inquest, Mr. Wales remaining until his presence was necessary at Dinas, in relation to the explosion there, when, much to my regret, he was obliged to leave us; Mr. Cadman and his assistant, Mr. Bain, however, continued at the inquest, and each rendered very careful and very valuable aid, alike to the coroner, to the jury, and to myself throughout the whole of the proceedings.

12. The inquest being necessarily an open investigation, and one manifestly throughout every stage of it, most deeply interesting not only to the inhabitants of Abercarn, but to the neighbourhood generally, the room in which the sittings were held was always very full, sometimes almost inconveniently crowded, but it is only right to say, if I may venture to do so, that throughout the whole of the protracted inquiry, occupying as it did no less than 25 days, the proceedings were conducted and watched with the greatest possible amount of good order in every way.

13. There were 55 witnesses examined; the testimony given by many of whom was somewhat long, and as, perhaps, was sure to be the case, there were some contradictions. These, however, were not only really very slight in themselves, but they appeared to my mind largely confirmatory of the general story, the differences being those of various individuals, seeing, probably, the same thing though under somewhat changed aspects, and with some few discrepancies; for example, in respect of an alleged and very occasional want of timber, which I am bound to say, although stated, was not in my opinion by any means reliably proved, the management under

under Mr. Pond seems to have been very carefully conducted, so much so indeed as to leave little or nothing to be desired in that respect.

14. In addition to the witnesses who were actually examined, there were, I think, three others whose testimony being corroborative merely, were not called for or taken.

15. There was also one young man, a collier of about the age of 20, who professed to be able to speak Welsh only, who had been produced along with other colliers, to give evidence, and whom, at my request, the Coroner offered to call, if either Mr. Wales, Mr. Cadman, Mr. Ward, Mr. Morgan, or myself had wished to have his testimony, but it was, eventually, thought unnecessary to examine him.

16. Of the 55 witnesses examined, 28 were colliers, that is, men engaged in cutting coal, 4 were timbermen, 4 overmen, 4 mining engineers, 3 managers, 2 masons, 2 pumpmen, 2 firemen, 1 hitcher, 1 engineman, 1 banksman, 1 labourer, 1 surveyor, 1 cashier, and a child who took a message from his father to an official (Mr. Bethell), now buried in the pit.

17. Besides the witnesses (strictly so called) Mr. Cadman, Mr. Bain, Mr. Pond, and Mr. Jordan, after being sworn, each handed in a written statement prepared by himself, which was treated as evidence, each of the deponents being duly examined and cross-examined by the professional advocates, by the Coroner, and, where necessary, by me.

18. Copies of these several statements, as well as a large plan, showing the underground workings in the pit, and also diagrams illustrating the "Long Wall" and "the Double Stall" systems of operation, and the ventilation, accompanied by sketches of the vertical section across the double stall near the face (No. 1), and another vertical section showing the manner of working across the long wall roads near the face (No. 2), will be found attached to this Report.

19. Although I have already mentioned Mr. Jordan and Mr. Pond by name, though not Mr. Higson, yet I think it may be of advantage if I point out here their several positions and duties:—

(*a*). Mr. *Jacob Higson*, of Stockport, is the consulting engineer of the company.

(*b*). Mr. *Robert Jordan* was the principal manager of the colliery. As I gathered, Mr. Jordan, though giving his superintendence to the mine generally, seems to have had, practically, more to do, perhaps, with the financial concerns of the undertaking than Mr. Pond.

(*c*). Mr. *Christopher Pond* acted as the certificated manager of the colliery at the time of the explosion, and had done so since 1873.

20. Mr. Pond is now about 37 years of age, and has spent all his life amongst collieries.

21. During the whole time that he has been manager of the Prince of Wales' Pit it appears to have been his constant habit to be in daily attendance on his duty there.

22. This, of course, consisted in a general superintendence of all matters connected with the actual working operations of the mine, engaging and discharging "hands," as well as in necessary occupations both above and below ground; indeed his ordinary routine of duty on the premises and about the pit seems to have been continuous and well sustained.

23. In addition to his own personal supervision he was more or less dependent upon the daily reports he found entered in the books of the pit by the overman and fireman after each "shift."

24. With the exception I have mentioned in regard to the written documents placed before the Coroner, all the witnesses were examined *vivâ voce*, and without any previous knowledge of the testimony to be adduced; and, notwithstanding

that a suggestion to that end was, more than once, made in order, if possible, to obtain "briefed statements" for the purposes of examination, it was found that such a method of procedure could not be carried into effect.

25. A copy of the special rules for the regulation of the pit is appended hereto.

26. All the books and documents relating to the affairs and management of the pit were most readily and willingly produced by the officers whenever asked for or wanted during the progress of the inquiry; indeed there seemed to be the most earnest desire on the part of the company, and each of its officials, to furnish every particle of information that could throw any light upon the matter:—

27. The following list contains the names of the overmen and firemen employed about the pit at the time of the explosion.

1. Edwin Bethell, head overman (dead).
2. Ephraim Watkins, overman in No. 2.
3. Andrew Ashman, overman in No. 17.
4. Elijah Lewis, night fireman in Nos. 2, 4, and 17.
5. Lewis Harris, night overman in No. 21.
6. Henry Tyrrell, fireman (dead).
7. John Marsh, overman at Cwmcarn.
8. George Harris, fireman.
9. David Rees, overman (dead).

28. The colliery was originally opened with a down-cast and an up-cast shaft only, at Abercarn.

29. Since then, however, another shaft, as is alluded to in my former Report, has been sunk at Cwmcarn, was finished, and the communication between it and the shaft at Abercarn completed shortly before this occurrence, though this new shaft can scarcely be said to have been brought into full use at the time of the explosion, and therefore, the Abercarn entrance was, even then, mainly used for "winding," and the other uses of the pit.

30. The mode of working was originally, and indeed until recently, that is about two years back, that of "Pillar and Stall" and "Double Stall," but the company had been, for the time I mention, endeavouring gradually to change that system for the one commonly known as the "Long Wall."

31. "Pillar and Stall" is so well known among the coal mining districts of England as to need no further description.

32. "Double Stall" in its main features, closely resembles "Pillar and Stall," differing from it, however, in that by the double-stall system; two "roads" are driven in, open to each other, in one face of 15 or 16 yards wide, having a strong pillar of coal left between them and the next pair of roads.

33. These roads are carried in, perhaps, 60 or 80 yards, and when exhausted, will be abandoned.

34. On such abandonment, the empty space would not in all cases be wholly packed or filled up, but only about 20 yards at the entrance to each road would be stowed up.

35. This plan of dealing with the works is locally known as "Bashing," and to this I shall recur hereafter.

36. As will be seen from the large plan of the underground operations, hereto annexed, the mine was divided into four or five different districts at considerable distances apart.

37. The entrance to the pit is in Abercarn; at the bottom are the sump-hole, engine-

engine-house, stables, as well as the down-cast and up-cast shafts, and a lamp-station.

38. The underground workings extend directly from west to east, and from north to south.

39. A straight line, named on the plan "Main Dukey-road, Engine-plane," runs the whole length of the north side from the shafts at Abercarn on the east, to the limit of the workings in No. 21 district, their most westerly point. This line is about $1\frac{1}{4}$ mile long.

40. The greatest breadth of the workings (save the new shaft road to Cwmcarn) extends along a line, named on the plan "No. 17, Dukey-road," from a point about half-way along the main Dukey-road on the north to the end of No. 17 district on the south, and is about three-quarters of a mile long.

41. A glance at the large plan also shows that the present working "Districts numbered respectively 2, 4, 17, 18, 22, and 21" are at a considerable distance from the shafts, whether at Abercarn or Cwmcarn. These districts are all connected with each other, though not, for the most part, immediately so.

42. As to the day's labour, the system pursued was that of the so-called "Three Shift," which means three several turns of eight hours each during the day (Sundays excepted).

43. This "three shift system" is again sub-divided, or is said to be sub-divided, between two relays of men for the winning of coal, and one relay, more especially for the purpose of repairing.

44. It is to be remarked that there is some doubt whether this three relay system was, or even could be, rigidly enforced, or observed; and it is, to my mind, very doubtful indeed whether any system by which the pit is, or may be, never clear of either colliers or repairers *can* be quite safe, seeing that the pit has scarcely ever time to cool, or the air to become wholly purified after it has once entered the pit.

45. Ventilation was effected by a very large Guibal fan.

46. The air going down was 348 cubic feet per minute per man, a supply said to be amply sufficient for all the purposes of the mine. After its entrance the air was, more or less, divided into "splits;" but great care seems to have been devoted to the sending enough wind along each of the proper air-courses to keep the pit as cool and free from gas as possible.

47. At each of these "splits" there were apparatus for regulating the passage of the air both as to direction and quantity, the appliances used being sometimes wooden, but more usually canvas-framed doors, hanging by hinges at the top and bottom, or sometimes by one or more sheet or sheets so placed as to allow the ordinary passage of the trains, while causing the least practicable displacement.

48. The doors were constructed so as to be self-closing, and the sheets necessarily were so, but with reference to both, great vigilance was at all times exerted as to keeping them in good order.

49. Wherever it was deemed advisable check-doors and check-sheets were used, so that when one was opened, the other would be closed, in order to preserve the air in its proper course.

50. In some very few, possibly in one or two instances only, a door boy was employed to open and shut the doors, where there was any need for such service, as at an incline, &c.

51. The haulier or driver walked before his trams, and he was assisted, more or less, by an assistant who pushed.

52. While the trams were being moved it was the duty of those engaged in that operation to keep their lamps as low as possible; they were usually sus-

pended by and to the waistbelt of the haulier, and held, sometimes, by the hook or ring in the mouth of the assistant.

53. The instant the tram had passed either door or sheet, the latter returned to its proper position, either by its own self-closing arrangement, or by being replaced.

54. In regard to lighting, no naked lights were allowed, except at the Abercarn end, close to the shafts, that is, about the stables, engine-sheds, &c. &c.

55. The lamps used throughout the pit were either "Davy" or "Clanny" lamps, the latter being in general use. I think it is open to serious doubt whether a "Clanny" lamp is not more unsafe alike from its "make," its being more liable to fracture, and its presenting a larger surface, in all respects, both as to its own size, its glass, and its larger surrounding of wire gauze through which gas may penetrate. Of course the light is brighter, and is preferred for working purposes, especially by the men themselves to the older "Davy," but whether, everything considered, it is as well adapted for the absolute safety of a mine, especially one carried through the black vein of a steam coal deposit is, in my opinion, a subject for very grave consideration indeed.

56. The air-currents were, necessarily, both very long and numerous, having to travel over so large a space, and having to be carried round each open pillar and stall, and in front of each face of long wall work in sufficient quantities to disperse any ordinary accummulation of gas.

57. Arrows marked upon the plan, as well as upon each of the smaller diagrams, show how the current of air was regulated and duly preserved.

58. As I mentioned "bashing" in paragraph 35 as being the method in use of dealing with abandoned workings, I think it desirable to point out what that process is.

59. It is, as has already been indicated, the local name for *partially* filling up old workings, so as to secure (as far as may be by such a course) the other parts of the pit from the outflow of gas or noxious vapour, as well as to keep the air-courses in proper line of action.

60. This bashing was taken through the whole length of the vacant space, and consisted of first filling up the "gob" with rubbish as high as was deemed requisite, and then building up a face wall to keep the stowage material within it.

61. By this operation, as is evident, the empty space would not, in all cases, or perhaps even in the majority of them, be entirely filled up, but merely about 20 yards at the entrance of each road would be so "bashed" or packed.

62. The especial object of this operation appears to be twofold; first, to make everything clean, and safe as possible by it, as I said; and second, to allow for additional room for closure by the natural "falls" or "squeezes" of the pit.

63. These falls were both numerous and extensive; it often happened that for some time, ranging from a few minutes or hours to a fortnight or three weeks, after their occurrence, the places where they were could no longer be thoroughly inspected.

64. It is only right, however, to add that immediately on such falls being discovered, as complete an examination as possible was set on foot, and every precaution taken either to clear it away or to make it the means of supposed additional security to the pit by "bashing" or filling up.

65. The disused workings were very extensive, the pit having been in continuous operation for many years.

66. Great consideration seems to have been devoted to the best method of dealing with fire-damp, after-damp and noxious vapours generally, so as to guard

guard against, and, if possible, to prevent them, as well as against the unexpected explosion of gas, or "blowers," as they are technically termed.

67. The seam was stated in evidence to be a fiery one, and it is not, perhaps, too much for me to say that from all the circumstances of this case, as well as those at Risca, in the immediate neighbourhood, a *very* fiery one.

68. This pit is also described as being "very dusty," an especial consequence of almost every instance of working in the "black vein" of a steam coal colliery, such as was the case here.

69. The explosion is described as having been a very violent one, by those who observed it, and beyond all doubt, from the description given of it by those who have been below since its occurrence, this was the case.

70. One or two of the witnesses spoke, though somewhat vaguely, as to hearing what they thought betokened *three* separate explosions, following each other almost immediately on the morning of the 11th of September, but although this may, possibly, have been the fact, the evidence in support of it is but very slight.

71. At this moment, with the exception of a very small number of bodies, of which the subject of the inquest was one, already brought to bank, nearly all the dead, to the number of 260, are still buried in the pit.

72. Up to the middle of December last great exertions were made to clear the pit; and arrive, not only at the bodies, but, if possible, at some clue to the immediate or proximate cause of the explosion, but without success.

73. Notice of discharge was then given to the men who had been employed, as it is understood to have been stated that the company found that it could no longer afford the expense of continued exploration, which was said to have amounted to a cost of many thousands of pounds up to that time.

74. However that may be, it is an undoubted fact that from one cause or other the exploration and rectification of the colliery are at present suspended, and Mr. Higson, the consulting engineer, on having the question put to him by one of the jury, answered that he was unable to state in what position the colliery then stood, nor could he say whether the explorations by the company could, or would, ever be resumed, though he said, in his opinion, it would be useless to adjourn the inquest for six months, because within that time nothing further would be done.

75. I learned, incidentally, though by means so closely connected with the sworn testimony of this inquiry, that I think it desirable to place on record here, that the fact of putting a stop to the explorations had created great disappointment in Abercarn and its neighbourhood, more especially among the friends and relations of the buried men.

76. I think it necessary to call attention to a few words in reference to this matter, which will be found in Mr. Cadman's statement, where he expresses the view, that if the explorations had been carried to the air-bridge in No. 4, Dukey-road, it would have been more satisfactory, and that he thought this air-bridge might have been reached in a few weeks if the work of exploration had gone on.

77. While there is no doubt that the official staff consisted of well-instructed and very intelligent and careful men, and while these officials themselves speak very highly of the workmen employed by the company, a character, generally speaking, apparently most thoroughly deserved; yet I cannot, and must not, forbear to say, that notwithstanding the special rule No. 42, in the book, there was, among some of the witnesses, a feeling very closely akin to carelessness, I do not like to say, recklessness, in withholding, or at least not disclosing, at the most opportune moment, or to the higher officials, the earliest information with regard to signs of impending danger.

78. This reticence, and the motive for it is, perhaps, two-fold: first, the workman fears lest he may injure his chances of employment by getting the character

of an habitual complainer, or that he may be accounted less brave than his companions; and, second, because, notwithstanding the special rule I have quoted, he does not always imagine it to be his individual or especial duty to convey the information beyond the overman or fireman of his district and shift; in other words, he seems to content himself with the idea that if he mentions the matter to either of these sub-officials he has discharged himself of *the whole* of his personal duty.

79. Whenever I found this to have been the case I remonstrated very *kindly* I hope, though very *gravely*, I am sure, with those who had so interpreted what their view of duty was; hoping, and I trust not altogether fruitlessly hoping, that some good might result from the very few words in which I thought it absolutely imperative to convey my own opinion on this matter.

80. As an instance of this want of caution, I may mention the following case:—It is an indisputable fact that about two hours before this explosion, 16 men and a boy simultaneously left their working places in No. 17 district, in a fashion very like that of a "strike," in consequence of some minor dispute about filling in rubbish, and it is worthy of remark that, in all probability, the cause of the explosion *may* have arisen somewhere in that part of the pit, and *not*, as is more generally supposed, in the No. 21 district. This, however, can only by possibility be discovered, if at all, when the Main Dukey-road is explored at and from the point of junction between it and the road into No. 17 district.

81. It was with much regret I found that the 30th General Rule under the Mines Regulation Act, giving the workmen the right to appoint an inspector of their own choosing, to visit and see through the mine, was, in this instance, admittedly nearly wholly a dead letter; the latest previous inspection, under the provision to which I have referred, having taken place so far back as July 1878, fully three months before the explosion. On looking over this report-book, there were some of the earlier leaves missing, the removal of which was not accounted for, but it is only fair to say the entry referring to the visit in July (as well as to some others) stated the condition of the pit to have been satisfactory to the inspecting visitors on that occasion.

82. Immediately after the explosion several gentlemen and workmen with great courage and self-abnegation descended the pit, where, to use the words of Mr. Cadman, a dreadful scene "of death, confusion, wreck, and desolation," was disclosed to them.

83. Some few of the men and boys (comparately speaking) who had been fortunate enough to escape, were crowdedly waiting for assistance from above, and for the descent of the cage, in order to reach "bank." The cage could not, however, be lowered to its customary position on account of the explosion having wrecked the bottom of the shaft. Still, by the aid of a ladder it was soon reached, and the survivors were brought out of the pit, most of them, happily, uninjured, but some few so burned and otherwise hurt, that they died soon after the rescue.

84. One very pleasing feature of the melancholy transaction is that an order was given and obeyed, by which the boys were brought up first.

85. Explorations were then commenced, and some few dead bodies were brought out of the pit.

86. These explorations were conducted by Mr. Cadman and Mr. Bain, personally, and the result is best told in the several statements of those gentlemen, appended to this Report.

87. They found it impossible to penetrate beyond a few yards in many parts of the workings, falls of coal, timber, and débris of all kinds offering an insuperable impediment.

88. The explorers, at great and manifest danger to themselves, continued their work till half-past six or seven in the evening, when, fearing another explosion,

plosion, they came to "Bank" in order to consult on the steps subsequently to be taken, and to which I have previously referred.

89. Many of the overmen, firemen, and workmen engaged in the operations of that day acted in a manner so noble, and obeyed orders so carefully and promptly for the rescue of their fellows, as to be deserving of all praise. It is very difficult, without being invidious, to single out or select particular cases, but I think I ought to mention one or two of those which struck me as having been exceptionally meritorious.

1. One man (named John Owen) while himself below, and when he was making his way out as quickly as he could, in order to save his own life, finding a youth overpowered and insensible, but still alive, took up the lad, threw him on to his (the rescuer's) own back, carrying him some distance through such a road, and at such a moment of extreme peril, and so brought him out of the pit; and, although I regret to say that the poor lad was so badly injured as to cause his death, that fact in no way detracts from the heroism of such a deed.

2. The man (John Harris) who first descended after the explosion, and who, finding the cage could not go down, most courageously made his way almost, if not absolutely, alone, and remained at what he considered his duty, in the earnest hope of doing good service by investigation, for many hours, although he well knew that any moment might be his last.

3. The pump-man (William Simonds), who I believe never ceased from continuous labour for 12 or 14 hours after the explosion, although he, too, was surrounded by danger nearly every moment, and

4. The men who volunteered to go, and went down in the first cage, amid all the smoke and confusion, on the very first instant they could go down, performing such a dangerous duty without either the slightest demur or hesitation. Their names are Thomas Herbert, Lewis Harris, Miles Moseley, John Hirst, Charles Preen, William Simmonds, William Waters, John Harris, and Charles Morgan.

90. Though it must be borne in mind that working miners have always formed a somewhat nomad population, I endeavoured to elicit from several of the older colliers, some of whom had been in the district many years, whether, to their observation, there had been any perceptible increase of danger from any cause (say), by the change in the method of winning, extension of the colliery works, depth of working, more or less ventilation, or want or depreciation of rolling stock or material, but I am bound to state that I heard but little in the character of complaint on this head, save in reference to an alleged momentary want of timber, and in regard to the change from "double stall" to "long wall" as the method of working.

91. As some further possible test, I also endeavoured to find out whether the old "hands" or earlier resident wage-classes had "emigrated" or left the valley in any abnormal numbers, but neither could I learn that such had ever been the case.

92. It is perhaps necessary to observe that in reference to the inquiries sought to be made into the matter suggested by the two last paragraphs, they could only be made of those who came to give evidence at the inquest, and with regard to it; and I could almost have wished, had it been possible, to have got at some testimony from persons wholly unconnected either with the colliery, its officials, or its business, or even non-residents in the valley of Abercarn, on this subject. It must not, however, be understood that I seek to throw any doubt on the truth of the evidence as given, still the other would have been, on the whole, probably more satisfactory.

93. I have to call attention to the several copies of Reports handed in by Mr. Cadman, Mr. Bain, Mr. Jordan and Mr. Pond, which were sworn to by each of those gentlemen, as well as to my own former Report, and the Plan and Diagrams attached to this Report [together with a transcript of my own Notes].

94. By way of summary, I may be permitted to observe that, although I am not an engineer, and consequently cannot give an opinion of much value from a merely scientific point of view, I may place on record some of the conclusions from this inquest, as they appear to my mind:—

These are then as follow; namely—

1. That the Prince of Wales' Pit, being worked in the black vein, was a fiery one, giving off explosive gas in large quantities, and that this gas was very apt to settle in the holes of the roof.

2. That the system, as to time, in operation, was that known as the "Three Shift" one, and was for the most part worked with the "Clanny" lamp.

3. That a change in the method of working had been comparatively recently introduced by the gradual substitution of the "long wall" for the previous "double stall," &c.

4. That the "long wall" system is, unquestionably, one by which more of the coal is taken away, and is, in all probability, at once less expensive, and more remunerative to those who "win" it.

5. That a large part of the traction operations is done by machinery; that is, by a wire or other rope being carried over rollers in the Dukey Roads.

6. That a system of "bashing," or only partially filling up old working working places, was carried on, and it is a very grave question whether such "bashing," more especially in a fiery mine, can ever be considered as satisfactory or sufficient stowage to prevent the outflow of gas, or keep up the reasonable security of the mine.

7. That, notwithstanding the unanimous opinion in its favour expressed by the civil engineers who gave evidence, there is some difference of opinion among those engaged in cutting coal, as to the unqualified advantage in working by "long wall" over the former method, especially in such a colliery as that of Abercarn.

8. That a new shaft had been recently sunk at Cwmcarn, which had improved the ventilation.

9. That on the morning of the explosion, and about two hours before it occurred, 16 men and a boy simultaneously left their working-places in No. 17 District.

10. That No. 17 and No. 21 Districts are connected with each other, as to roads, air currents, &c., through their Dukey Roads, though not very closely so.

11. That the strong opinion of the Inspector is that from the direction in which the timber and *débris* were blown by the explosion, it originated in No. 21 District.

12. That while the explosion may undoubtedly have occurred from accident or carelessness, such, for instance, as is mentioned in these Reports, yet it is more in accordance with probability to assume that it arose from some sudden and unexpected outburst of gas wholly beyond power and control as to its violence and velocity.

13. That the official staff was fairly, perhaps even, unusually effective, and the discipline good.

14. That the workmen appear to have been in the main steady men, though many of them, from not being able to read or write, could not make themselves as clearly masters of the Special Rules, &c., as might be desirable.

15. That notwithstanding such general features, there were some of the men who occasionally acted very incautiously, since in one instance certainly, if not in more than one, the workman being suspicious, if not actually

actually aware, of impending danger, appears to have thought it wholly unnecessary to do more than merely mention it to the overman of his shift, evidently on the supposition that by so doing he had thrown the *whole* responsibility off his own shoulders.

16. That there is not any permanent or even fixed periodical inspection by the men themselves under the 30th general rule of the Mines Regulation Act, 1872, and that notwithstanding their attention has been repeatedly called to the subject by Mr. Cadman himself as the Inspector of the district.

17. That it becomes a very grave and serious question whether from any, or all the combined causes of "three shift" working, of "bashing," the use of "Clanny lamps," "mechanical traction," and working by the "long wall" system in a fiery mine such as this, an increase of danger may not be apprehended, the great problem being how best (if at all possible) to lessen it.

18. That, since the latter end of December 1878, all work at and exploration within the pit have ceased, and it is doubtful whether it ever will be resumed, and that, even should it be so, it is still doubtful when, though certainly not for some considerable period.

19. That, beyond what is stated in paragraph 12 of this summary, the actual cause of the explosion is undetermined and unknown, resting merely on inference and deduction.

20. That the finding by the coroner's jury was, "That John Hall met his death by an explosion of gas in the Prince of Wales' Pit, Abercarn, but how it occurred we have no evidence to prove:" and that this was the only possible verdict under the circumstances.

In concluding this Report, I think it right to say that the Coroner and jury requested me to call attention to the fact that they sat, as in duty bound, giving their most patient care to the details of this inquest during the time, almost unprecedented, of something like 25 days, and they asked me respectfully to suggest that special provision should be made in this, and any similar instance, which can only be of very rare occurrence, for some remuneration, if it can possibly be given.

I have, &c.
(signed) *Wm. St. James Wheelhouse.*

TRANSCRIPT of NOTES by Mr. *William St. J. Wheelhouse* (with Plan).—16th December 1878 to 1st February 1879.

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MINUTES OF EVIDENCE

TAKEN before *W. H. Brewer*, Esq., Coroner, on the ABERCARNE COLLIERY EXPLOSION, at the Crown Inn, Abercarne.

Monday, 16*th December* 1878.—The Inquest resumed.

Names of Jury called over.

Mr. *Walter Morgan*, of Pontypridd, solicitor, appeared for relatives of the deceased, for Charlotte Simmons (widow of William), and instructed by and on behalf of the Miners of South Wales.

Mr. *Wheelhouse* appeared, instructed by Treasury, for the Home Office.

Mr. *Ward*, for Ebbw Vale Company (Limited).

JOHN FORSYTH ROWBOTHAM, sworn; Examined by the *Coroner*.

GENERAL Manager for Ebbw Vale Company. Registered name is Ebbw Vale Steel, Iron, and Coal Company (Limited).

Mineral agents and managers are as follows:—Principal mineral agent is Robert Jordan; certificated manager at Abercarn, Christopher Pond; and they are the responsible managers of colliery. I know nothing about the accident.

No cross-examination.

LEWIS EDMUNDS, sworn; Examined by the *Coroner*.

I LIVE at Ebbw Vale, and am Surveyor to the Company for the Abercarn Colliery Works. This large plan is one of the works there. We have prepared lithographed plans of half the size of the working plans. These are they; they are quite correct. (*Plans placed upon the table; one handed to Mr. Morgan and another to me.*)

By Mr. *Morgan.*] This is the working plan, and is dated 17th June 1878.

By Mr. *Ward.*] The progress of the workings have been since carried on from our books, but I cannot swear to anything beyond the 17th of June 1878, though the workings have been entered on the plan since the explosion.

JOHN DREW, sworn; Examined by the *Coroner*.

I WAS a Hitcher at the Abercarn Pit. I was down the pit on the day of accident at work there. I had been working from 7 a.m. I found everything safe; no danger signal, or anything of that kind. I worked till about noon, when the accident occurred. I was working till the accident happened. The fireman and overmen were down before me, and all was, apparently, safe. I never felt any apprehension of danger, and always plenty of wind passing through. I was taking a rest at the moment the explosion took place. There was an empty bottom at that moment, *i.e.*, no coal ready. I was knocked down by the explosion, and rendered insensible, but for how long I do not know. My hand was hurt, and I have never been able to work since. I know Mr. Pond; he has done his work well, so far as I know, as to keeping the pit safe, and wind passing through.

By a *Juryman.*] We never had a pipe there; pipes are not allowed down there, nor smoking. I have been working at the same work for over three years.

By Mr. *Cadman.*] I had cutting work to do before I was put on as a hitcher. That was about five years ago. I was on No. 2 (the river) side of the pit, inside the little engine-house. I was sitting when I was blown over. I cannot say which way the blast came. I saw no fire. There were other hitchers (Henry Golding and two others) there by the lamp-post. They were all killed. Nathaniel Jones and John Beak were there, too; they were killed. Their bodies have been brought to bank. They were found in the shaft at the bottom of the pit in the carriage-hole. I think they must have been blown in there.

By Mr. *Morgan.*] We used naked lights where I was. I know nothing of the other workings of the pit for the last three years.

By Mr. *Wheelhouse.*] I have never observed gas there during my time. The overman and fireman I spoke to are both killed. Three firemen and overmen were all down that day, and all were killed. The other hitchers would be carried seven or eight yards. The blast seemed to come from No. 21 side. I first found myself, after I recovered, at home at my own cottage. I found my face, back, and hip burnt. The other two, who were in the engine-house, are since dead of their burns. Mr. Pond was down nearly every day examining the pit; certainly four or five times a week, sometimes more than once a day, and was very careful, so far as I know. It would be my duty to complain to the fireman or overman. I never had to complain all the time I was there about

about gas or want of air. During the time I was winning coal, I never had occasion to complain of gas or want of air. I never heard any complaint about naked lights in the workings.

By a *Juryman.*] I never found any gas there. I was working in No. 21 during the time I was in the pit.

By Mr. *Morgan* (with permission of *Coroner*).] I do not remember any difficulty between me and Mr. Pond about tapping gas.

JOHN JORDAN, sworn; Examined by the *Coroner.*

I AM Engine-driver at Abercarn Colliery. At the time of the explosion I was working the underground engine. I first felt a shock of the air in the engine-house which knocked me down off my feet, apparently by rushing in. For a minute or two I was not rendered insensible. I ran out of the engine-house immediately, and got to the bottom of the pit. I felt both gas and afterdamp. Then I became insensible. I recovered my senses while I was still lying at the bottom of the pit. I got on to my feet, and I heard some of the men shouting and screaming. I thought my brother's voice was among them, and I went to the carriage hole and found him there. I helped to lift him out. His head was just above the receiving plates. I lifted him out of the hole. I carried him away, but the afterdamp came upon us a few yards afterwards, and I fell again. My brother died afterwards. I again recovered, and managed to get on to my feet, and I saw the carriage come down to the bottom of the pit with lights. I went into the carriage with assistance, and so was brought to bank. I have been a little over 12 months at the Abercarn Colliery as working engineer. I have never been in danger (as a feeling on my part) about gas. I knew gas came out of the coal, but that was all. I never heard there was anything unusual as to gas about the pit. The overman ought to come and tell me, as well as other men, of any danger; and had there been any danger I should most likely have heard the men say so. I always thought there was enough air to scatter the gas, and had I thought there had been any danger I should not have gone down.

By Mr. *Cadman.*] I was working at the new engine on the river side of the pit (the west). My brother was working at the bottom of the pit. His duty was that of overman at the shaft bottom. He was an overman among the hitchers. I believe he was on the 21 or 22 side, as the blowing had carried him into the carriage hole. I thought there were two or three explosions altogether, for I had heard two or three noises like thunder after the first, which was the most severe. I saw no fire. When the second occurred I was in the pipe-way.

By Mr. *Morgan.*] I used safety lamps, not naked lights. I was 20 yards off the shaft, not more. It was a little warm, and that was the reason why we used safety-lamps. The noise seemed to me to come from No. 4, on the river side, that is, the east side. I heard no noise till the rush of air came. The engine was standing at the time, but certainly had not been standing for half-an-hour. We had drawn from No. 4 all that morning, as well as No. 2.

By Mr. *Wheelhouse.*] The journey was for No. 2 at the time of the first explosion. I know they were working at No. 4 that morning; about the usual quantity had been got that day. We generally run alternate journeys into No. 2 and No. 4, but not always. I do not remember whether there were two journeys together from No. 2. The naked lights, so far as I know, would be three-quarters of a mile from the workings (*see* Rule 34). This rule was properly carried out. I have never had occasion to complain to overmen or firemen of want of ventilation or air in the pit, or of the escape of gas.

[Adjourned for Half-an-hour.

THOMAS WILLIAMS, sworn; Examined by the *Coroner.*

I AM Banksman at Abercarn Colliery. On the 11th of September I was there at my work up to the time of the explosion, which happened at 12.15 p.m. (noon), as nearly as I can recollect. Been banksman about nine months. The men were down before I came that morning, the night banksman having put them down. His name is Osborn Hughes.

By Mr. *Cadman.*] I heard explosion, saw smoke and dust. Heard the second explosion almost instantly, not half a minute afterwards, and then I ran down. When I heard the second report I went away by myself. I thought the machinery might be blown on to the top of me, and I went away. I went down the incline, and then I heard a third explosion, about a minute after the second one. I saw Mr. Humphreys there; he was struck senseless. He was in the engine-house. Mr. Humphreys is alive. Flooring-plates on the top of the bank were blown up. There was a large amount of dust and smoke came up. Humphreys was knocked down by the "puff." All the time between the first and last explosions was about three minutes. No one that I know of ever complained to Mr. Pond about the gas, nor did I do so, or about the ventilation or management of the pit.

WILLIAM SIMMONDS, sworn; Examined by the *Coroner.*

I AM Pitman at Abercarn Colliery, or pumpman there. I was on duty at the time of accident at the big pit (No. 6). I was in my own house at the time of the explosion. I had been quarter-of-an-hour away. About quarter-of-an-hour before that I had been at the pit top. I heard the explosion, and saw a man who asked me to turn water down the pit. I ran down at once, and when the men asked me, I turned it down to make a draught in the pit. Some men asked me to start the pump. I did so. I went to No. 1 down in the pit, about 60 yards on the bond. I then opened the valve and started the pump there. I worked the pump two or three strokes. I turned water into the pit. I gave orders for the change of bond to the banksman

banksman or engineman at the top. After going down the 60 yards I came to the top again, and there gave orders to the engineman to start the pump, which worked the two or three strokes I mentioned, and was then stopped. I took the bond down to the bottom. Thomas Albert, Lewis Harris, Miles Moseley, John Hirst, and another man (Charles Preen) went with us. When we got within 10 or 20 feet of the bottom of the shaft we could go no further. I did not get any further down in the carriage or with it, but I did get down without the carriage to the bottom, except about the distance of 6 feet, when I heard the men screaming. I pointed out the way for those below to get up on to a balk of timber, and so into the carriage. I had got back again then to the carriage. We brought six up on the bond; they were alive, and are so now, for aught I know. I afterwards went down again and helped to recover John Hall. He was then dead. I believe the 70 or 80 I helped to bring up are all alive now.

No cross-examination.

THOMAS HERBERT, sworn; Examined by the *Coroner*.

I AM a Collier at Abercarn Pit. I was not in the colliery, but was working in the yard outside, in the timber yard. I had gone at 8.30 a.m. to get timber to send into pit for myself that night when I went down. The night shift begins at 6 p.m. I was on the turnpike-road at the moment of explosion. I saw smoke and smelt sulphur coming up from the pit's mouth, through the downcast shaft. I saw the roof of the upcast blown off, covering the top of the shaft. I ran to the top of the pit. I saw the doors of the upcast blown open, the entrance doors. I then got assistance to close the doors. I got on the top of the shaft; I saw the top of the ladder damaged, and then we succeeded in getting the roof of the upcast into its place again. I went down into the shaft, and assisted to get up all of them, dead or alive. I do not know how many were brought up, but certainly more than five.

By Mr. *Cadman*.] I work at No. 2 hard heading. I was cutting coal at the far end of that district, at the farthest road. I have worked there for six months, and have been 18 months altogether, and the whole time in that district. I have seen gas in No. 2 district. I was stopped by the fireman from going in because there was gas there. We were then working "double stall." We had been working long wall before this explosion occurred. I speak now only of No. 2. I have not seen any gas lately in that district. I travel to my work right through the intake, so could not see any. I found plenty of wind, sometimes even too much, in that place. I have known our lamps blown out. We never leave any space open after the workings are done with. We always fill up again, so far as I have seen; after having got the coal out we fill up the gob.

By Mr. *Morgan*.] I was working in a heading, when I found plenty of wind there. I have worked in a stall, but did not find too much wind there. It is six months since I worked in a stall, nor have I worked in a stall since I began the long wall system. I know nothing of the ventilation of the stalls since I began the long wall system. We had one fall only in my workings in our heading. I do not know that there were many falls in my district. It took us about a fortnight, two men at a shift, to clear this fall. The wind travelled up my face, and down the other face. We used a good deal of timber and had plenty always, indeed more than sufficient to guard against danger. The fireman and overman would tell me if there were any want of timber. The timber was what I went into the yard to get, and if there were not plenty of timber I should stop, or be stopped till there was. When the fall took place I do not know how the supply of wind beyond the fall was obtained. I never had any complaint from anybody about not having sufficient timber, nor any complaint about anybody requiring too much of it.

By Mr. *Ward*.] I have never complained, or had any reason to complain, of want of timber. When we had not sufficient, I mean it was when I had not picked it out, and so we were stopped for want of it, but there was timber in the yard, I believe.

[Adjourned till To-morrow.

[Here I have inserted Mr. Jordan's Report dated 18th November 1878 (*see* Appendix).]

Tuesday, 17th December 1878.

DANIEL THOMAS, sworn; Examined by the *Coroner*.

I AM a Collier at the Abercarn Pit. I was ill on the day of explosion, and therefore off work that day. I was ill six weeks. The pit was quite safe where I was working when I broke off. I was working near a place called "the fault." On the evening of the explosion I went down the pit. I carried water to the bottom of the Old Pit. I went with Mr. Pond after we had d'outed the fire to No. 2 side. There was no fire on that side. We went through the stables first, and afterwards to the Dukey Road, in the hard heading; we then went to the Dukey parting.

By Mr. *Cadman*.] I have worked here 19 years. I was a fireman part of my time. I began as a collier. I have worked in No. 2 district more than a twelvemonth; I was cutting coal there. The ventilation was good where I was working. I was engaged at long wall face in one of the stall roads. There was sufficient wind passing. We worked about 6 feet of coal in depth. There would be from 2 to 3 feet above our "holing."

It was packed up tight and fast, so that gas could not accumulate in my place. We had a fall, but never one so extensive as to stop ventilation. I have worked long work for about six months in that place. Before then I had worked double stall. Double stall work fell, but we had heavier falls by the long work than by double stall. I do not know of any place in the gob left open where gas could accumulate. I never heard any complaints by the men of want of wind. I have not seen any gas while I have been working long work there.

By Mr. *Morgan.*] Packers did the packing and stopping; they were employed to pack up at nights. I cannot give you names, because we were changing every week. I think one man's name was William Abraham. They came in with rubbish every night to gob up. Sometimes 6 feet were left between the gob and the face, sometimes up to 4 feet. Both sides were properly filled up at my place, and the middle was also properly filled up, both middle and sides. If a fall took place in the face, we should not clear that away, but should go on working. Sometimes we drove down by the side of a fall, leaving it there. We were perfectly safe, the ventilation being good, and amply sufficient to carry away any gas. We would not work there, if there were any danger. We could not always get the same amount of ventilation if a fall obstructed it. I never recollect any instance of more than a single fall at one time, but there was an occasion where there was another fall before the previous one had been quite removed. I do not recollect any instance where different falls had taken place on the same face. We were working at about 6 feet high. The height from the collar to the plate was about 6 feet, and the height from the collar about 9 inches. The height of the Dukey Road is in some parts 6 feet, and in some 9 feet. The road was 9 feet wide generally, if not always. That was the general rule. When a squeeze came it would be less, and it might be so that we could not work. The collar is only 6 feet. I had always plenty of timber supplied to me.

By Mr. *Wheelhouse.*] The workings might be wholly stopped by a fall, say in my heading, my stall, or the face I worked at, and then the first thing to be done would be to clear away the wind-road, and restore the ventilation as quickly as could be. The colliers would be stopped till that was done, and the restoration made.

JOSEPH WILLIAMS, sworn; Examined by the *Coroner.*

I AM an Underground Timberman at Abercarn Colliery. I worked at nights in No. 17. I was at home above ground when the explosion happened. I had come up that morning about 8.30 a.m. The part I was in when I came up was in very good order in every way. I had been down there every night for a fortnight, and everything where I was seemed safe; no gas there. I have been working since the 11th of May; my workings have been safe during all that time. I knew of no danger in any other part of the place.

By Mr. *Cadman.*] I was constantly at that time timbering the stalls, and now and again working as a collier. My work was continuous. I never saw any gas there; not a bit, and the ventilation was especially good there. We had the first wind from the Cwmcarn shaft from the time we turned the road. I never heard any complaint at all about the ventilation in that district. We had no difficulty in keeping the top up in the long work. The gob was stowed tight there, too tight for us. My stall was in a face of long work. There was too much muck taken in there on a night by the nightman and stoppers. I only travel to my own heading, and I speak about it only; not about others.

By Mr. *Morgan.*] I was working in the next heading to John Games. He turned to the right, and I to the left in No. 17. There were nine stalls between me and Cwmcarn, but I don't know how many there were on the other side. No one ever told me of gas in that district at any time.

HEZEKIAH HARVEY, sworn; Examined by the *Coroner.*

I AM a Collier at Abercarn Colliery. I was working on the day of the explosion up to 11.20 a.m., when we came up. I have been employed there 16 months. I have not had any complaint to find about ventilation or the accumulation of gas. I was never afraid while working there. I have been underground many years; 16 years from now I have been in Ebbw Vale. I have not found any more gas there than I have found at other places in this valley. In No. 17 District, where I was working, all seemed to me always to be safe, perfectly. I never heard any complaints either of excess of gas or of the want of ventilation in my district.

By Mr. *Cadman.*] That morning we came out, because of a dispute between us and Mr. Pond as to what we should be paid for unloading rubbish. We all came out of No. 17 in consequence of the dispute only. We had plenty of rubbish to fill up in my part, and it was all filled up both in Games's place and mine. There was no sign of danger when we came out; not a bit. In fact, we could not get a livelihood on the conditions we were then unloading the rubbish.

By Mr. *Morgan.*] I did not work in the same vein as at Ebbw Vale. This mine has, naturally, more gas than at the other place. The butty had placed the rubbish there for unloading, but we came up without unloading it. There would be no time for gas to collect, because the night-shift came in before we went out. If the night-shift did not come in, the gob would stand and not be filled up. It might be that there were no orders for coal, and so we had to stand now and then, though very seldom. Gas might collect when the gob was not filled up. No one would go down on purpose to fill up the gob. I have known us stopped two days for want of waggons, but that was the longest time I ever recollect. We filled up the gob ourselves, and there would be no other place to fill up till more coal was got out. Rubbish was brought to us to fill up the gob with. If we thought there would be an

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idle day on the following morning, we should fill up the gobs ourselves, so as to be ready for such time as we might go down again. We had it filled up too close; there was no time to unload it. Thomas Philips was coming to tell us to unload it, when we met him as we were going out. We had had several talks with the overman about the price for unloading. I told Edward (Bethell), the overman, that I would not unload rubbish again, that is, in the day-time, when we were filling in coals. I never heard the name of "the Quarry," and I do not know that there is such a place. I never knew of any place where a hole was made to get rubbish out to fill up, where gas could collect. There was no fall in my district, nor in the facings. I had the first pull of the wind, and had plenty of ventilation; indeed, too much, for I could scarcely keep my lamp in. The wind would have to pass every man after me.

By Mr. *Ward.*] I was nearest to the downcast shaft. I had more wind here than I had at Ebbw Vale. All the men came out of No. 17 together.

By the *Jury.*] I have worked in No. 21 as well as in No. 17. I never saw gas there. Seventeen, that is, 16 men and my boy, came out that morning. Any man could walk down the heading. I never left my own heading that morning before I came out, as I have mentioned. I struck a bit of soft coal and saw some little gas, but this was six months before the explosion. I came into No. 17 just after the Cwmcarn Shaft was driven. I never worked that morning; never took off my clothes.

By Mr. *Wheelhouse.*] I, Israel Bateman, Edward Lambert, and George Gregory, went down the Cwmcarn Pit after the explosion. We went to the workings where I had worked before the explosion. Andrew Ashman and John Marsh were there. Ashman is overman below, and Marsh at the top of the Cwmcarn Pit. According to orders I got a couple of shovels from the pit head, and came down again. We cleared out the deep in about two hours. I did not go back to the return. There was a good current of wind down the Cwmcarn Shaft. No ventilation was coming from the Aberearn side. I saw three bodies lying there, but I did not see if they were burnt.

ISRAEL BATEMAN, sworn; Examined by the *Coroner.*

COLLIER at Abercarn. On the day of the explosion I was down in the pit. I went down for the day-shift about six a.m. I did not work that day. I was in No. 17 District, and did not work because of the dispute about the rubbish. I came up about 11 in that forenoon. I had been working three or four years at this pit. The gas had been quite right during all that time, and the ventilation was very good. I was the third stall from Cwmcarn. I have never heard any complaints made about ventilation where I have been working. At Risca I worked from nine to ten years with naked lights in the rock vein. Risca is not a fiery pit, so far as the rock vein is concerned. I worked in the black vein there for three months. That is the same vein as at Abercarn.

By Mr. *Cadman.*] I have never heard any complaints about gas or ventilation in any part of the pit at Abercarn. I worked in No. 17 District for 12 months, and before that in No. 4 District. I worked long work in No. 4. In No. 4 the gob was stowed tight in our district, so much so that we had scarcely room for our own rubbish. We came out wholly in consequence of the dispute about rubbish. I never saw any gas in No. 17 District. We had as much timber as we wanted.

By Mr. *Morgan.*] I never heard of gas where I have been working, nor have I heard, except to a small extent, of gas being in the pit, but I have heard of some little, very little. I heard that there was gas in No. 4 District, but that was a twelvemonth back or even more. It is quite as much as that. That was during the time I myself was working in No. 4. The fireman or overman, whichever of them saw it first, made the complaint. He told the men that they must not work because there was gas there. I never heard any complaint from the men. It was before the men came, but the mark left by the fireman was there to stop them, because there was danger. There was a cross (×) up whenever there was any danger, especially from fire. That was the only intimation of gas in No. 4. I heard the fireman and men talking on the top of the pit about the fire. No one could work in the heading when there was danger; the fireman told the men that they must go out, and they did so whenever that was the case. When I saw the danger mark up was the only time it was there while I worked in No. 4. They got rubbish from the puckers; they did not get it from Richard Saunders's abandoned heading, or stall rather, while I was there. I worked in No. 17 District before Cwmcarn heading was through for four or five months. I did not know that the Government inspector had stopped all working in that district. I left that district 12 months ago. I did not come back to No. 17 District. The Cwmcarn heading was through and completed immediately that I came back. I went down the Cwmcarn Pit two hours after the explosion; I saw three bodies there lying dead, but don't know whether they were burnt or not. John Games was one, Rees Howell and John Lewis the other two. Games was in his stall repairing. Howell was by the tram. Lewis was by his horse. I heard John Marsh mention their names.

By Mr. *Ward.*] These men were all in their places where they were working. I worked in Cwmcarn both before and after the Cwmcarn heading was driven; the supply of air was very greatly increased after the Cwmcarn heading was opened. In No. 17 District everything was very well ventilated, especially after that heading was opened.

By the *Jury.*] I only worked three months at the black vein.

By Mr. *Wheelhouse.*] The overman or fireman went round every night after we had done our work.

Wednesday, 18*th December* 1878.

JOHN ADAMS, sworn; Examined by the *Coroner*.

I AM a Collier at Abercarn Pit. I was down in the pit the night before the explosion, and stayed down till about 6 a.m. on the 11th at my work. I worked at a stall. There was plenty of air where I was working. I was in No. 21 District; I have been working about two years. It has always been safe where I have been working. I never heard any complaints of gas where I worked.

By Mr. *Cadman*.] I have also been working in No. 18 District, but have worked for two years in No. 21. I have been working in long work for about a fortnight. I changed with a man there, but how long it had been going on I do not know. It was 40 yards from the heading to the stall. I had known a bit of gas at the place I worked in before, and then the place was stopped. That gas was in No. 21 District. There were four stalls; that is, a short face of long work. The whole of those four stalls were stopped. I worked about 6 feet of the coal, and left about 3 feet up. I had always enough rubbish to stow up the gob tightly. It was well packed up, say 4 or 5 feet, or within 6 feet of the face. I did not know of any places left open. I have not known of any large falls in any of the places where I have been at work. The air ventilating my place came from the old Abercarn Pit. I saw nothing out of order when I came out of the pit that morning; it was the same as usual. There was one fall in the long work; I saw it, but it was in another man's place. I do not think there are more falls in the long work than in the other. When coal falls, gas comes with it sometimes in large quantities, more or less.

By Mr. *Wales*.] I saw gas in the place I was working about 14 days before. There was only a little in the face, and it came down about a foot, and extended a few yards along the face. The point where this gas was, was a place where no one was working. It was close to some old workings; therefore it was that the four places were stopped. I never found gas there before or after. When I was pulling the coal down, I removed a little, and then the gas came down. The fireman came along just at that time, and he stopped me. That was the only time I was stopped. If there be a fall of coal from the top, gas generally comes with it. Gas does not always come with it. The soft coal (neish) gives off the gas. The top coal does not generally fall. We drive up 60 yards. The width of the face is seven yards, and is mostly worked by two men. Another man had worked the stall before I went to it. I don't call four roads "long work." Before that time I saw gas in the four roads. I never saw gas in the long work, though I worked there three months. I had no falls there, not one. The fireman came about 7 p.m. I went in at six. There was no gas there when I went in. The day fireman would go round about four or five o'clock in the evening. The night fireman came to my place about seven. The day fireman had put his mark there. The mark was a chalk mark of the day of the month. The fireman always puts a mark, and the collier sees it. If the mark were not there, I should not work. I am quite sure that I saw a mark that day, so that I am sure the fireman had been there, but when the night fireman came he found gas there, as I have told you. It is well understood that the fireman puts his mark in every place. When the night fireman came in and found gas there, he stopped me. We do not fire powder in any way nor use it, either for taking down the top or anything else.

By the *Jury*.] They were driving these stalls towards the old workings, but in the direction of No. 22 District. I do not know what these old workings were, for I never worked on that side before. I was not aware that there was any gas fastened up in old 22. I worked eight years in the pit. I was not aware that there was gas there. The fireman said No. 21 was blocked up, as they were not going to work there any more. George Harris was the night fireman who stopped me. I first discovered the gas. He came, said it was so, and told me to work no more there. It was neish coal there. Cracks were in it; the last "going off." The gas came from the top, not from the cracks. It cracked a good bit, but not up to the white.

By Mr. *Morgan*.] I found the cracks one turn before I was stopped. It struck me that I was getting near old workings when I saw the cracks in the top. Joseph Gay, an overman, came to me the day I found the cracks. He did not say anything about them. This was the first day I had noticed cracks. When Gay came I showed him the cracks. He did not tell me to drive bore-holes. I had been told by the overman that I was not to work much longer in that part. He had told me the day before. That was the first day I saw the cracks, but he never told me why they should not go much further. He did not tell me when to stop. Henry Terrell was the day fireman. He is dead. Gay is also dead. The fireman's mark was put upon the box, not upon the stall. I don't recollect the day of the month, but I can read. I got to my stall about seven o'clock on the 10th of September, at the four-stall work. I left off working there that night, which was on the Monday. My butty was there. The previous shift men had left that stall before I got down. The stall was empty when I got there. I worked there in the day every other week. The fireman put the day of the month. The mark in the morning and evening are the same, both being the day of the month. If the morning mark had not been rubbed out there would be two marks there. The marks would be put on the same box. The day fireman does not put any mark at all. I always looked very carefully for this mark. The night fireman makes this mark in the morning, and that is the only mark made. This mark is made generally about 5 or 6 a.m. This is the last duty of the night fireman before he leaves the pit. The mark I saw on the Monday night had been made on the Sunday night. A day-shift had worked on the Monday there by that mark. I do not know that they got rubbish from a place called the "Baltic" to fill up the gobs. I only heard of the "Baltic" by name,

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and the man who worked there told me of it. The ventilation would be, and indeed was, better after the Cwmcarn Pit was sunk. It was not too warm where I was working. I had plenty of wind there. My brother George was killed there. He was working in the lower level, I believe, but not near me. He told me that he was going to turn another stall. He told me so the week before, but he did not tell me when he was going to begin this other stall. He gave no reason for the change, nor did I ask him. He said he had finished the other stall. He did not tell me it was on account of any danger. He was working in Joseph Clifford's place a week before the explosion. He worked in that place for one or two days, but I am not sure which. This was about the time when he and I talked about turning the new stall. It was not usual for one man to work in another man's stall, but they sometimes did it. My brother went to Joseph Clifford's place because my brother's own stall was stopped. I do not know that it was suddenly stopped. I went in through the main Dukey, then through the middle level at the lamp station to my working place. I should think I went 400 or 500 yards over the middle level; then I went into the lower level, and went 600 or 700 yards over that. I had to get through two doors to the lower level. I got into the return to my work. In the return it was better than in the intake. My lamp did not get very hot; never inconveniently so. I never noticed any change in the flame of my lamp from the intake or the return. I never saw a cap on the flame.

By Mr. *Ward.*] When I saw gas, I told the fireman directly, and the fireman told us not to work, there and then. We have to ask the overman's permission to go to another stall, and could only go when permission was obtained.

CHARLES ROBERTS, sworn; Examined by the *Coroner.*

I WAS a Collier at Abercarn. I am at Galenon now. I was at Abercarn before and at the time of the explosion. I was in the pit on the day of the explosion. I was then working at No. 17 District. I went down at half-past six or a quarter to seven. I found all safe in my stall when I went down. No sign or symptom of gas. I began to work at Abercarn 11 years ago. I came after the strike at that time. During that time I have found gas. I knew it was dangerous, for I understood it, and I have gone out on account of it. I worked nearly all that time, except about two months, when I was out, in consequence of a personal dispute between Mr. Llewellyn and me, but this had nothing to do with gas or danger. I came back many years ago, and I did not leave Abercarn Pit on account of any feeling of danger.

By Mr. *Cadman.*] I was one of the 17 men who came out on the morning of the explosion. I came out solely on account of the dispute about packing. I never saw any gas in No. 17. I had been working in No. 17 about two months. I worked in a stall-road. It might be 10 or 12 yards that my stall had gone in. My stall was not so well stowed up; there was a vacancy in my district of from 10 to 12 yards from the face. It was more open on the side than in the middle. I built a gob-wall on each side of the road. We had not rubbish to fill it up. We left, perhaps, 4 or 5 feet across the gob; this is in depth. This work was very high, and it would take such a lot to fill it. We worked the whole 9 feet up to the white. We had just begun to leave the bottom coal at the time of the explosion. This was being done so as to get height. There was generally plenty of rubbish to fill up a 6-feet gob. We got to the bottom of the pit to come out about 11.30, about half-an-hour before the explosion. I did not notice anything unusual on that day. I saw no trace of gas in the road that day, but I had seen a little on other occasions. On the 5th of September I noticed a cap, in No. 4 Return, about an inch deep. That was the only time I have seen it in that district. When in No. 4 I saw a little also. I worked in No. 4 for four years. I have sometimes seen a large cap in No. 4. The general ventilation was improved by No. 4 being opened to the Cwmcarn Shaft. When in No. 4, the fireman, on one occasion, stopped us and sent us out, and told us to open the wind-road; this was about six months before, but after Mr. Llewellyn left. I don't know whether No. 4 gets any wind from Cwmcarn. There was more gas came out of No. 4 than out of No. 17 District where I was working. I have worked at No. 21 and 22 in Mr. Llewellyn's time. That is four or five years ago. I do not know how long Mr. Needham was here, nor when Mr. Llewellyn left; I never troubled about such matters.

By Mr. *Morgan.*] I went to work at No. 17 through the return. It was very warm there. My lamp got hot. Some part was short, some very strong as to wind in the return way. The fireman would go through the Dukey Road more than the return. I could not walk along the roads upright. Some parts of the roads were plenty high enough, other parts very low; some of them only 4 to 5 feet high. Except when I went through a hole out of the return to No. 17, through which I went, when I went on my hands and knees, going into the working at No. 17 from the return. It would be about a foot or two through, not more. This was two or three weeks, certainly more than a week before the accident. On the day of the explosion, it was not made quite a good road there. I mean the return way. There were two returns from that point. My stall was 800 or 900 yards from the Cwmcarn Pit. I worked near Hezekiah Harvey. I was working long work. I have seen falls in No. 17 District, but not falls where I was working. I saw the roads where the falls were, and the men working to remove them. We could see the fall where the hole at the top was. I have seen other holes in the top. We had plenty of wind where I was in No. 17. I never found falls to interfere, in that part, with the ventilation. In coming back through the returns, I have seen sheets placed in the returns. I have seen five sheets, I believe. I do not know what they were placed there for. There were four crane sheets and one flying sheet. They are generally used for turning wind into stalls. There were not any stalls on the return into which to turn the wind. I have occasionally seen sheets used to baffle the wind into holes on account of gas being there. I never put up a sheet except where it had been knocked down. I heard that rubbish was brought from the

the quarry to fill up with, but I know that rubbish was brought from a stall to fill up our gob. I never knew the number of the stall, but it was one that had fallen. There was nothing placed in this stall instead of the rubbish taken out of it. That stall had been finished. There was not any occasion to clear that stall that I know of, except to bring the rubbish out of it to us to fill up with. I do not know of any workings in No. 4 not filled up. Sometimes the stall was filled up; sometimes a "bashing" was put up. A bashing is a wall across the mouth of a stall. Some of the stalls were 60 yards in from the heading. Sometimes the bashing would be 10 or 15 yards, sometimes not so much. I should not like to say how short the shortest bashing was.

By Mr. *Ward.*] I saw gas at Sychbant's heading at different times, about six months before explosion. I noticed Davis's lamp another day about the same time. In No. 4 I saw gas a third time in Sychbant's heading, about five months before the explosion. On the 5th of September, when I was coming out, I saw a cap of an inch to an inch and a-half on my lamp. I reported it to William Waters, the fireman. We sent the boy; he came and told us not to work there till he came back (Waters). I did not go myself but sent the boy, and I told the haulier also. The fireman came within half an hour of our telling it. The fireman was there on the second occasion when we discovered gas. The fireman took such steps as he thought proper to investigate as to the quantity of gas. The third time we saw the cap on the lamp was when David Rees was there. He stopped us this third time, and sent us to open a wind-road. On the 5th of September Mr. Pond blackguarded me for coming out before the end of my turn, having business of my own. I told Thomas Saunders about that. He was a person put on as a fireman, if the night man were away. I did not tell Mr. Pond. I did not go to the nearest lamp station, nor did I inquire for the fireman. I did not consider that three-foot hole dangerous. Horses worked in No. 17 District. I think they went down the other return. I never saw any horses in the heading, which was 4 feet high. The return might be 5 feet high. On the old double parting in No. 4, the collars were 9 feet high. The air-way was 15 feet wide at the bottom and 5 feet high. The custom was altered when the double stall system was used, but since then the new plan has been followed.

Monday, 6th January 1879.

Charles Roberts, re-called.

When I worked in No. 4 District I worked in Sychbant's heading. I left that place five or six months before the explosion. We left it because there was gas there. We couched some, and some we took away, of the tools that we were using; those we left behind were what we could not carry away. We asked if we might go back for them, and he said no, not without he was with us. Thomas Saunders brought the tools out for us afterwards. He went to draw timber out. There was one door on Sychbant's heading. Sychbant's heading would be about 300 yards. I cannot say how the wind came, unless down the heading. The door was there to turn the wind into Alban Morgan's heading. There was nothing there except this to convey the wind to Morgan's heading. I do not know how or why the Sychbant's heading was closed up. I was sent by David Rees to repair the wind-road, which was very small. Rees went through first, then my butty. I tried to get through, but got fast, and then, having cleared away something, I got through with much difficulty. This wind-road was in Sychbant's heading. I worked in No. 4 before the Cwmcarn Shaft was sunk, as well as afterwards. The ventilation was not improved in No. 4 District, so far as I think. Sychbant's heading and Morgan's heading were bashed up near the spot where the sheets were. Beyond what I have said I don't know why the cranes were put up; all I know is that they were there. In No. 17 there was previously another heading, but they found a fall there, and then we used the other smaller heading or road through the stall-hole. We had had to travel through the Dukey Road; then we went through the other way.

By Mr. *Cadman.*] Sychbant's heading was first double-stall; then long work system. It had been worked over a year double-stall.

By Mr. *Ward.*] In No. 4 the ventilation was sufficient to disperse it as gas accumulated. When we worked double-stall system there was plenty of ventilation. The last time I worked there there was too much gas, but this was five or six months before the explosion. I had worked there four years. I meant Sychbant's heading when I said there was too much gas there. I had to leave Sychbant's heading three times in the four years, on account of an unusual amount of gas in it. It was long work in Sychbant's heading, and in Aberdare heading after that. I never reported this gas to anybody up to the time Sychbant's heading was closed. I never had cause to complain before the first time I did so. When the fireman came he told us gas was accumulating, and ordered us away. If the ventilation were sufficient, there would be no accumulation of gas. It was a custom when we wanted timber to put our mark down in the office. We have put it down a week at a time without getting timber. I cannot give you any particular date. It might have been a twelvemonth before the explosion, or within that date. It was so often; it was a common thing. We had to do it many times, over and over again. William Waters was told many a time. He is alive. It was not the custom for the collier to pick his own timber; there were men kept on purpose. We told the overman, David Rees, who is dead, when he came through, that we wanted timber. I think I may say, with a clear conscience, that I have told every overman in the district of want of timber. We have had a small fall on more occasions than one from this want of timber.

timber. We were told to go and get it, and then we went and got it. The timber was stored in different places. I never worked where there was danger. If there was a want of timber I came out, because I thought it was dangerous. I came out many times on this account, but I cannot give you the dates. I have come out both in summer and winter. When I was working double stall, there was no one in danger but me and my butty. I cannot remember that I ever left for want of timber after the double-stall system was given up. We were afraid of the top falling in upon us when we were without timber. I never knew gas accumulate from my being short of timber. I have often asked Mr. Pond a question, but he would not stay to listen to me. I never complained to Mr. Pond of danger, as I remember.

By Mr. *Wheelhouse.*] When I said, on a former day, that Mr. Pond "blackguarded" me for coming out of my work before my time, I did not mean he used violent language, but he was very cross. I cannot say why he was cross, because I left my butty to do the work, I suppose, was his reason for being so. When I came out, I left the place as safe as I could. Mr. Pond knows best why he was cross. I told him I had a little business to do, and he said I had no right to leave my work. When I could not get timber, I did not complain to Mr. Pond, because I thought the overman and fireman were responsible; I cannot say why timber was not supplied, when it was on the spot. There were men whose duty it was to bring in the timber. I did not speak to Mr. Pond, because we had faith in the overman and fireman. I have many a time asked Mr. Pond a question, and he would not stay to listen. I have asked him one question and he has answered me, but he has gone before I could ask him another; I am slower of speech than most men. I have never had to complain of any danger without getting a fair hearing.

THOMAS SMITH, sworn; Examined by the *Coroner.*

I AM a Collier at Abercarn Pit. I worked there on the 10th, the day before the explosion, going down at 3 p.m. for the evening shift. I was working in No. 17 district. I found everything right and safe when I was working that day. I came up about 6.30 a.m. on the 11th. I had no notice of anything wrong or dangerous. I have worked in that district six months. I have never seen any gas in that district while I have been working there, nor have I heard any complaint about the escape of gas. I was at home when the explosion happened. I never knew of any gas firing while I was there.

By Mr. *Cadman.*] I have worked in Abercarn two years and a half. I worked at Cwmcarn shaft making, and at Glenlyon before that. I worked at the coal for about six months. I was repairing before that time. I was hitching a part of the two quarters and a half. All the time I worked I was in No. 17 district. I have seen gas, but not in Abercarn Pit. I was working in Michael's heading. I came out by way of the return. I saw no gas; it was a good walking road, only one little place rather small, about 4 feet high, by 1½ yard to 2 yards, and 5 feet wide. I never heard any complaints from any other district. Horses did not pass through the whole of that return. The small place was what they call "the hole," coming from No. 4.

By Mr. *Wales.*] I saw some gas in the Cwmcarn shaft when I was there. All we colliers came out the same way; I among them. I could not say whether it was further than the other, but we were not allowed to walk down the Dukey Road, which was dangerous on account of the trams, though there were holes for safety about every 20 yards. These holes were for men to go into. The air ventilating my place came from the Cwmcarn shaft.

By Mr. *Morgan.*] The place they called "the hole" was a place where they worked and got coal. They did not get rubbish from there. I don't know what it was used for, except for getting coal. I never saw them get rubbish from there. I had only come along that same way three times before the explosion happened. I was obliged to stoop to get through the 4-foot hole I spoke of; I had to stoop in many places. Some places were 5 feet, but there were none lower than 4 feet. The place I named as 5 feet was a guess; the other places were higher than that. I worked, I think, the third place from Charles Roberts. I worked long work. On the morning of the explosion I came along that place of 4 feet high. Before the three last times I went through the next heading, but there was a mark there, and we had to go through this one because of that danger-mark. I cut coal that night exactly as usual. I worked in a stall about 40 yards long; that is the stall-road I mean. I never saw a door on that heading. Joseph Williams worked by day in that same place. Thomas Williams was working next to me, I think. The air was turned into our stalls by sheet; I am sure of that. The danger-mark was up on the morning of the explosion.

By Mr. *Ward.*] I never heard Charles Roberts complain of want of timber. Whenever I wanted timber I always had plenty for asking for it. I always had proper and civil answers when I asked questions of those in authority. I never heard either Roberts or any of the men complain for want of timber. I recollect a fall when Charles Roberts helped me out of it. That was not for want of timber. I was fixing timber at that time, and I displaced some coal in doing so. I was a timberman.

By Mr. *Wheelhouse.*] It is the overman's duty to find timber, and to cause it to be carried to the place where it was wanted; I never had to wait any length of time after asking for timber. If it had not been brought, I should have reported to the overman, perhaps next day; I never asked the overman twice for timber. I always asked for it in time. If a person waited till the last moment, he might have to wait a day. If a collier waited till the last moment, it would be very imprudent.

THOMAS PHILLIPS, sworn; Examined by the *Coroner.*

I WAS a Collier in No. 21 district. I went down at 6 p.m. on the 10th, and came up at 6 a.m. on the 11th. Everything was right where I was till I came up again. I have worked in this pit 11 or 12 years; I have generally found it safe. I have seen gas in No. 21 district, but not

not lately; nor have I heard lately any complaints about gas. I never saw any sign of gas while I was down on the 10th or 11th.

By Mr. *Cadman.*] I did not know of any place where it was dangerous. I worked at a stall in a face of long work. The road was from 30 to 35 yards long. I had always pretty well of rubbish; plenty of it. We chucked it in as far as we could to fill in the gob. I have been short of timber lately; I was so on the night before the explosion. My gob was about a yard and a half from the face of the coal when I left it. It was a middling top; not very good. There was no fall, either in my place or anywhere else, that I knew of. We carried up the timber and made the place all secure, so far as I knew. We worked about 5 feet of the coal where I was engaged. We left coal for the roof, I think, of about 2 feet. I have seen gas in the district, but not in the long work where I was working. I saw it in Thomas Rees's heading. I do not know how it came, except that all the old places were not bashed up. Outside of the bashing there were some open places.

By Mr. *Wales.*] Bashing is filling up a place; if there be no rubbish, the top falls after they get the timber out. After a fall they bash up. When a fall takes place, I think gas will come. I never saw any gas come through a bashing. I have seen gas come out of an old road; I saw it when we were fetching timber and plates; there was then gas in the top. This was about two months before the explosion; Isaac Williams worked in that stall before it was stopped. I don't know how the gas was, whether it was bashed or not. I cannot tell how it would be likely to get out. If they had more rubbish than was wanted for the gob, it was used for filling up old roadways; this did not often happen. I have been only a few weeks at getting coal. I know the difference between stalls and long work. I never knew of gas coming over the top of a gob.

By the *Jury.*] The filling was in the face of a stall. It was not all walled up to the top; there was about a yard, or a yard and a half. The wind and ventilation were very good. I was driving up by those four stalls, but they were stopped; why I do not know, nor can I say what was done with them. I saw gas; Tyrrell's lamp showed it. A lamp, if drawn down quickly, there would be a tendency to explode.

By Mr. *Morgan.*] I have seen gas in a lamp in Abercarn Pit, but only once. That was 8 or 10 weeks before the explosion. The fireman, Tyrrell, who was killed, was with me when I saw it. I did not find it very warm. When I sweated, I took off my shirt. The air was very good, and in plenty, in No. 21. The return air was warm and foul. I never saw a cap on my lamp, but I never tried for gas there myself. I worked at Game's heading.

By Mr. *Ward.*] The black vein always gives off gas, but it was always removed as soon as it appeared. We asked for timber once, for three days. There was plenty of timber; we went for it ourselves. We had to fetch timber a long way sometimes, but we could always have it for fetching. I was working in Enoch White's stall. There was a fall down below, but I did not see it; I was only told so. That was, perhaps, a week or more before the explosion. There was one wooden door where I was working. That door was in the main heading.

By Mr. *Wheelhouse.*] It might be nine or ten weeks before the explosion when I saw gas in the district for the last time. On the night before the explosion I did not see any gas coming out over the gob; supposing 17 men left their work on the morning of the explosion, it might be dangerous.

Tuesday, 7th January 1879.

Samuel Toplis, sworn; Examined by the *Coroner.*

Collier at Abercarn when explosion happened. I had worked there for nine years previously. I had not any complaint to make. I came out of the pit at 10.40 on the morning of explosion. I had gone in at 6 that morning. I had cleaned up the place ready for working, but had not cut any coal that morning. I had been working there, in No. 17 district, the day before. I had cut six or eight tons of coal, and the place was all safe then. I saw no gas anywhere. I have not heard colliers complain of gas. I never was afraid to work or felt danger; if I had done so, I would not have worked there. I worked along with a butty, at stall work; my butty was not there that day, but there were two men working along side of me. They did not complain of any gas. All the years I have been at Abercarn I think this pit has been as well free of gas as any pit could be. I work with a lamp, and when I have noticed a cap on it I have come out at once, and have acquainted all those working near me. I came out on account of the rubbish dispute. They wanted us to unload a tram of rubbish for every load of coal we filled. We objected to do that, because we were not paid for it. We looked for 3 *d.* a tram for unloading the rubbish, and they would not give it. It has been the custom to pay the colliers for unloading the rubbish trams. I do not know if that be the custom at any other pit.

By Mr. *Cadman.*] I have been a collier all the time for nine years, except nine months, when I was timbering. I had been working for two months in No. 17 district. We had not got ours opened to the long work quite, but we had commenced on the long work. I cannot say whether all were tightly stowed up in No. 17, for we were expected to keep to our own places. Before that, I was in No. 4 at long work, and there I had too much rubbish. The coal was soft at the bottom, and so we had to stow it with the gob. I never saw gas this time in No. 17, but I had seen it there before. This was when the Cwmcarn heading was being driven 15 or 18 months back.

back. It was not much then, but enough for us to go till the fireman came. When we came out I noticed nothing unusual in the workings. On our way out we came most of the way through the return to the Abercarn shaft. We neither tried for, nor noticed gas on our way out. Some of our road out was very good, and other portions not so good. It wanted repairs all the time. We could walk out without much difficulty. Trams could pass along all that way, if required, and a horse might be taken through. In No. 17 district we had always plenty of wind for every purpose after Cwmcarn was sunk, and the wind, all of it, after that came from Cwmcarn. I was working in Nos. 8 and 10 districts for 8 or 10 months. We noticed gas coming once, in a large body, when the doors had not been shut after the hauliers. It came through the facings. This was about four months before the explosion. We went back, told the fireman, returned, closed the doors, and it then became all right. There were two doors, both left open on the intake, with some coal left against them by the lads. If these doors were left open, there would show something wrong, a cap on the lamp, do you see. I have seen coal fall off the carriage and so stop the road. I reported to the fireman, who came directly afterwards, that the doors had been left open. Ordinarily there was plenty of wind in No. 4 district. Before I went to No. 4, I worked in Cwmcarn heading. I was there, I think, nearly two years. Before that, I had worked at No. 4. In the No. 2 district, where I worked, they were well stowed indeed; when I worked there, there has been too much stowing. I never knew of a "blower" coming out of that pit.

By Mr. *Wales.*] I cannot tell when it was that I noticed the cap on my lamp. It was in No. 4, about four months before the explosion; it was the same occasion as when the two doors had been left open. The very little boys sometimes stopped by the doors; but six weeks before the explosion the boys were ordered to stop by the doors altogether, and the hauliers went by themselves, the boys no longer following the hauliers. The haulier would go on after the horse, the boy before it, and then it was the duty of the haulier to shut the door.

By the *Jury.*] I was never frightened during the whole nine years; I see no difference in the working of the pit, for safety's sake, between the early part of that nine years and now. The Cwmcarn shaft, being open, made the ventilation better for us. I have not worked in the 21 district since 1874. I don't remember gas coming from old workings in No. 22 district. I do not recollect ever having to come through the intake on account of gas.

By Mr. *Morgan.*] I do not recollect many falls in No. 17 district. We were opening up the long work quite new, not clearing away falls. I spoke at a meeting, soon after the explosion, in this room. I swear I said nothing about falls at that meeting. I never said anything about any danger; I merely described the method of working. Gas came out when we were bashing, but we went on bashing as soon as ever we could do it. It was done as quickly as ever we could. We stopped till 3 o'clock doing it. I have worked in Sychbant's heading. It was eight or nine months before the explosion. I worked there from three to four months. I never noticed gas while I worked there. There were two of us, I and another, working in that heading. I do not know that there were ever three working there. I never complained for want of wind there. I cannot say what way the wind came along Sychbant's heading. There were so many headings open just there, we could not tell. There was a horse-road along there. I did not know which side, whether Abercarn or Cwmcarn, was the point from which the air was supplied. I saw some stalls in Thomas Rees's heading. Gas came through there till we bashed it up. I recollect a crane being put up in Thomas Saunders's heading, to turn the air into Rees's heading; I do not recollect that crane falling. We did not see much gas. I have had words with Mr. Pond, but I do not recollect when, but it was because I went to Thomas Rees's heading. The quarrel had no reference to timber, falls, gas, or ventilation. He had put me to another place, and I did not like it. I have not been talking with Mr. Pond since the meeting, particularly, but I have been at the office talking with Mr. Pond, but I did not talk to him about what I had said at the public meeting. I asked for work, and he told me I might have it in about a fortnight.

By Mr. *Ward.*] I was drawing timber and plates away. This seam always gives out gas, but I have always found plenty of air to dissipate the gas. I never saw or heard of a cap an inch and a half high. I never heard Roberts complain of the gas. I was paid for timber. It was very seldom there was any want of timber there. I am now working at Newport Abercarn Pits.

By the *Coroner.*] I do not know whether the overman had been round that morning before I went down. The doors were all self-closing. The quantity of gas coming from bashings was not very extensive. Rees was in the next heading, and he did not notice it. James Coombs was on duty as fireman that morning.

By Mr. *Wheelhouse.*] Only once during the last nine months had I to leave my work on account of gas, and, I think, not more than three or four times during the nine years. After leaving my work on account of gas, I generally returned the following day. I do not know the reason for the change in the practice of letting the boys follow the haulier. It is likely that the change was made to prevent the doors being left open by coal falling. The doors are made to swing to after the trams have passed through, and they will close if nothing falls to prevent them.

JAMES SMITH, sworn; Examined by the *Coroner.*

I AM a Timberman in 22 and 4 return. I came out at 5 a.m. on the 11th of September. I went down for the night-shift at 6 the night before. I worked all night, finding everything very good as to workings. I found no sign of gas, nor was there any danger whatever. I put some timber up in No. 21 return, close by the air bridge. I was on all night. I finished about 4. I put the timber up about 12 or 1 o'clock, as nearly as I can remember. I have been working about eight years among the timber. I always found the ventilation very good since I have been there. I never found a bit of gas from the return. I always thought it safe. I never worked as

as a collier. I never heard of want of ventilation. I always felt perfectly safe there.

By Mr. *Cadman.*] I had from bottom of air-bridge where Dukey-road crossed in No. 21 return, and from the first air-bridge in No. 4 return there. I had been between three and four years on that return and road. Before that I was timbering in No. 22 district. There I had some of the deeps and the return. We were ordered to keep No. 21 at 9-feet arms and 6-feet collar, and generally, a good deal of it was so. All the rest were collars 6 feet and arms 6 feet. I never measured them, but I know the arms are about 6 feet or 6 feet and a half. There was very little less than 6 feet. In fitting in the timbers, there was very little taken off at the bottom. The tram-plates were left down through the road where I was. There was no fall before the explosion, that is, immediately before it, in the roads where I was working. The wind came from Cwmcarn way. I have noticed my lamp many times, but never noticed a cap on it. I recollect Cwmcarn heading being joined to the rest of the pit. When that was opened, I found a sight more air coming my way.

By Mr. *Morgan.*] I cannot tell how much road I had to timber; not a mile. There was also another timberman, Thomas Edwards, who had been 12 months there with me at the same road and work. We went over the roads every night, to see that it was all safe. We had not to put timber in two or three places in this return, just before the explosion happened. The timber would be put up in what seemed to us the worst places. There are not more than two timbermen in those districts, and they are plenty for the work. The third man was taken off at least a twelvemonth before the explosion. Lately there has not been so much "squeeze" as formerly. Two timbermen were quite sufficient immediately before the explosion. I could work with my clothes on in the return very well. I did not find it very warm, or in anyway overheated. I never saw any falls there recently, nor for the last four years. Workmen came to cut the bottoms to get puckings. They took it as near the bottom as possible, except where the bottom was very hard. They would then cut the bottom, and leave the sides.

WILLIAM WATERS, sworn; Examined by the *Coroner.*

COLLIER at Abercarn Pit. I was down on the 10th of September, going down at 2 p.m. I went to work cutting coal. I worked till 11.30 p.m., and then came up. I found a little gas in my stall where I was working. We returned back, and went to see what was the matter, and we found a sheet that was not properly hung; the haulier had passed through it, and had not closed it properly. I and my butty stayed outside till the place cleared; then we went back to work. After that there was nothing further occurred till I went home. I have been working over 20 years at Abercarn Colliery. I began on the 9th at this very place, but I had worked in that district before. I found everything safe. I found a little gas there on Saturday the 7th, for on that day a squeeze came, and let some gas off in consequence of that, and a fall in this long work. Mr. Pond came through, found the squeeze, and I was sent for. He told me to stop there for that evening, to see that the gas did not spread so as to hurt the other men who were timbering. I did stop there till 3 o'clock, when the men had all finished their timbering. The gas went about 15 yards down the faces from where it broke out. I went to work again on the Monday. It was then quite clear in my place. It was properly timbered that day, and sufficiently propped.

Wednesday, 8th January 1879.

WILLIAM WATERS, re-called; Examined by the *Coroner.*

I WAS working in No. 4 district. On Saturday night there was a squeeze, and a fall, and gas came off with the fall. Mr. Pond ordered all the men who were cutting coal to go out of their places, and they went, and then he picked out a certain number to put in cogs and timber. I was put there to watch the gas. I came out at 3 p.m. on Saturday. I went down at 2 p.m. on Monday. I went to work in my place, but some of the places had fallen. I worked on that Monday and Tuesday evening regularly at my work. The falls were left, but we were working so as to put them right. We were three in the stall; I was in two, up above me, but how many in the stall above I do not know. On the Tuesday evening I saw some signs of gas, but not on the Monday. There was air going through, but not in the same quantities as before the fall. It acted as a check. I do not know whether the falls were high. The gas came from the fall on to the face. There was not much of a cap on our lamps. It came towards me from the fall, and I was at the outside working-place. I came out at 11.30 p.m., and it was then right in my place, though the fall was not then cleared away. I saw no signs of gas when I came out. If there had been no fall, there would have been plenty of wind in that place. It was not very hot there. I commenced working in that stall on the Monday. On the Saturday I had been working on the stall above, and had been in that district about three months. I had been doing a narrow heading. It went in from 30 to 35 yards, and was next but one from Thomas Saunders. The gob was very well filled up. I knew of no place, nor heard of any being left open. The coal is generally soft, and wherever that is so there is sure to be more gas. I never knew but one sudden outburst of gas; that was some time ago, but I did not see it, I only heard of it. Before I went to work in

No. 4, as a collier, I was a fireman there; that is about three months ago. I was a fireman more than six years. I do not know why I left being a fireman; I was in No. 4 and No. 2 heading. I was in No. 4 at the time when the Cwmcarn heading was cut through. It made a great improvement in ventilating when the Cwmcarn Pit was sunk, and opened. It made the pit also safer. I never saw any want of timber generally, but we could not always get it when wanted. On the Saturday before the explosion there was no want of it. We had then plenty; so we had on the Monday and Tuesday afterwards. I came out by way of the return on Tuesday; the air was nice and cool, just as it used to be. There was *no* cap on my lamp. This return was a horse-road, and there were rails all the way. A big horse could go right through it. I never heard any complaint of gas in that district, nor was there any complaint about gas that day. I do not know that the gas could have any room to lodge either on the Monday or Tuesday.

By Mr. *Wales.*] I saw a little cap on my lamp on the Monday, but it did not fire in my lamp. The gas did not come to my working place. From the fall to the nearest working place was 25 or 30 yards. The gas was not explosive at that distance; it would be so at 10 or 15 yards from the fall. The wind was sufficient if everything had been right. There was quite plenty for the men to work with; I know all about the district and the return. I found my lamp all right but once, when there was a little cap on it. It was 400 or 500 yards from this place, and it was something like eight months ago. When I saw it there was just sufficient to be seen, but it was not explosive. I found it rather worse up in the faces. This arose from a fall checking the air on the intake. All the colliers were then withdrawn, only sufficient being left to clear away the fall, which was done about noon. It was quite cleared by next shift (6 p.m.) On Monday morning the fireman and men went down from 6 to 6.30. The fireman of the night before examined the workplaces before the men went down; that is, the colliers; he would come up about 5 a.m., enter the state of the pit in the book in the office, and then leave.

The afternoon shift went down at 2 p.m., and finished at 10 or 11 at night. Then the fireman, who went in at 6 o'clock p.m., would examine the place during the night. The day fireman went down at 6 o'clock. The examination was done by the night fireman. The colliers would meet the night fireman on the top of the pit. If there were anything wrong he would wait to tell the men. The lamps were locked on the top, and they were re-examined at the bottom of the pit, thus they were examined twice. If a lamp went out, the man would have to take it to the lamp station, say 900 yards from where I had worked about that time.

By the *Jury.*] I always examined the work places of the men before they went down when I was day fireman, and I examined every working place in my district.

By Mr. *Morgan.*] The afternoon shift began to work as soon as the others finished. Colliers were at work when I made my examinations. If the men were in, I put *no* mark, if out, I put one. I went my round from half-past 7 a.m. to 3 p.m. The overman would see the place, and the collier would not go out unless there were something wrong. We did not depend on the man coming to tell us if there were anything the matter; I or the overman should see it. If it were safe *no* mark would be put up; necessarily, if there were danger there would be a mark. On the Tuesday night I did not see a fireman in my place of working. The sheet of which I spoke, was between two stalls turning the air, and was coming through two stalls to the next. This was the sole purpose of putting up the sheet. There was a little strain upon the sheet; it was nailed to the timber at the top, and loose at the bottom. There was nothing to keep it fast at the bottom. I went out only once that night; I believed, at the time I found gas, that it was because the sheet had lost a corner nail, and one corner was down; I do not know how it had become wrong. I found the responsibility of a fireman's position more than I liked, and so I went to collier-work. The ventilation was better in No. 4, but it was not much improved by Cwmcarn, but we had a greater flow of wind from Abercarn in consequence of it. I knew Sychbant's heading in No. 4. The top part of that heading was abandoned and bashed up; it was bashed up a fortnight or three weeks after it was abandoned. The bashing was well stowed up, I am sure. It was bashed top and bottom, middle part was left. In Sychbant's heading there was only one door. There was a sheet above, and another below that door, which conveyed air to those working places when this door was opened. When that door was open, these sheets were ample for driving the air along this heading. Sychbant's heading was closed about six months before the explosion. I was sent by Mr. Pond to put up cranes, because there was a slight escape of gas through the bashing over the timber. They were put up to blow wind up to the spot where the gas was working out. No attempt was made at re-opening it at that time when the gas was working out, but this gas was cleared away altogether. It ceased to show any cap on the lamp; I do not know how long these sheets were kept up there, nor whether they were there when the explosion happened. I cannot tell you what would have been the consequence if those sheets had been taken away. I recollect Davy's deep finished about three years ago; it was not a return. The level was a return. I do not remember whether I struck into old workings in Davy's deep. I knew Aberdare heading; there were three doors there. Morgan drove a stall in David Rees's heading. There was a hole struck into some old workings, and a little gas then came from there, I cannot tell you how much. It is four years ago, it came off David Rees's heading. We filled the hole up with rubbish; the hole was about six inches each way; it was a small hole in the bottom coal. I knew Thomas Saunders's heading; there was a fall there about five months before the explosion. I cannot say when it was cleared away, but I walked over it, although I had to stoop a little. I have had a brattice-man to assist me while I was a fireman. I had not been a fireman for three months before the explosion. The long wall system does not require so many brattice-men. I knew Richard Saunders's heading; there was one door on that heading only. I was working at the time of the explosion in John Colley's road on the Monday before it happened. On the Saturday I had worked in the stall above, but only for one day. I did not leave at all on account of gas; I was previously working off Thomas Saunders's head-

ing; that was stopped by the manager on the Friday. The ventilation was very well then, because there was a cross-cut within eight or nine yards of it. We drew the timber out because it was *not* wanted any longer. There was the usual quantity of timber there, nine feet; but I do not know why we left it. To go to Colley's-road I had to pass the headings I had formerly worked in on Thomas Saunders's heading. On the mouth of that I saw the danger-mark. I saw no escape of gas from the black vein while I was fireman. There was no daily inspection there; it was not full of water while I was fireman. Since the long work system was adopted we never kept the sheet tight, or the door, so that we might split up the supply of air as it was. The sheets were put betwixt the two stalls, on the extreme of the headings. The stalls were 60 yards, but since the long work was commenced I have not seen a road in my district over 50 yards. There was sufficient air "scaled" through the sheet for purposes of ventilation there; the sheet would be placed across the heading; that would not prevent air from getting along. We had to scale our sheets so as to carry air to all places; they were all flying sheets; we took care not to put them too tight. I regulated that as best I could; I put two sheets, so that a greater quantity of air could go by into the air-way on the stall heading, if the case required it; it is not often that there is any complaint of too much air.

By Mr. *Ward.*] This seam gives off a good deal of gas in the faces; but while I was fireman there was always sufficient wind to disperse it when it was given off, and to keep the workings in due order. There was less space left after the long-wall system was brought into operation; the places would be filled up fuller and tighter. I have heard small bumpers. It is like a great shot of a gun or a cannon, which tells us that there has been a crack in the roof. These bumpers occasionally dislodge the props and timber, causing the coal sometimes to fall; then a cavity in the roof would be formed where gas might collect. The first thing we should do would be to examine the place where the bumper had been, and take steps to remove any gas there. The collier would come and report if the bumper were a heavy one. I always considered that proper means were taken to remove gas, and we had, since Cwmcarn was opened, sufficient wind. The witness, Charles Roberts, has complained to me of a want of timber, even when he had timber in his own place at the time of complaining. Sometimes we were short—once at a chance. We had generally sufficient timber in stock in the yard. It is possible that timber might be misdirected into some part of the workings. After bashing up, say, Sychbant's heading, the gas would work itself out, and so be quite cleared away.

By Mr. *Morgan.*] I have seen timber while he was complaining to me. It was then in his stall, and I showed it to him. There were three sticks on one side, and three on the other, in the roadway opposite his stall. Some was new, some old; three sticks of the one, and three of the other. If they had wanted any alteration he could have made them all right. He said they were too big for him; I told him to put them up. It would be lighter for him, no doubt, to have had lighter timber to handle about. Many other men asked me to let them have timber; no one but Roberts complained to me. I should see the timber delayed if it did not come properly. We have been occasionally short of timber "once and again;" but I have never been some days short of it.

By the *Coroner.*] Men give their number to the timber man on the surface, and a list is made, and then entered in a book, which is kept in the office; I do not know whether this book can be produced.

By Mr. *Wheelhouse* (who, subject to the coroner's ruling otherwise, asked that all books might be produced, and was told that they were all then ready for production).] I think Charles Roberts complained that the timber was too heavy. I told him to come away if he found it not safe to work. All timber going down the pit was booked, and the requisition for timber would be on a slip. Within more than 500 yards of any open light there were never any working operations going on, so far as getting coal was concerned.

HENRY ADAMS, sworn; Examined by the *Coroner.*

I AM a collier at Abercarn Pit. I came out on the morning of the explosion, having been on the night-shift that week. I came about half past six out, and had been working there through all the night before. I found all right in the pit where I was. There was no sign of gas, and I had plenty of timber; I have been 14 months there this last time. I have worked at Risca also. I never heard any complaint of gas in the workings for the last 14 months; I have not seen any myself. I worked in No. 21 district the last two night turns. Before that I was working in No. 17 district. I saw nothing out of its usual course. I saw both the overman and fireman come through my place on the Tuesday night. Their names were Lewis Harris and George Harris; they are brothers, I believe. I saw *no* mark of danger, and I should have observed it had there been one. I worked here in 1869; I saw more gas *then* than since, and there was more gas formerly.

By Mr. *Cadman.*] I only worked two turns in No. 21 district. I had worked there before. We were removed when Cwmcarn was opened out. The last two turns I worked at long-work. I noticed no falls during those two turns. Before, when I was here at work, we expected some serious accident. We then had to leave our work often on account of gas. I found it better ventilated now than many collieries I have been into. Since Cwmcarn was opened I have found plenty of ventilation. I never saw any gas in No. 17; we then had the wind from Cwmcarn. In No. 21 there was some neglect in my place. This was a "hole," a sort of working place out of which they were regularly taking rubbish out of the solid there. There were places each side of me. The gob was not stowed up behind us tight, not enough rubbish. There was about 6½ feet taken from the regular face of coal. There was coal left above me. Some 10 or 12 feet space were left behind me. Behind this, it

it was stowed all tight, and I cannot say that there was any neglect at all, except what I have mentioned. I had to remove to 21 from 17, because of the falls. These falls happened during the week previous to the explosion. I was not in No. 17 district afterwards from the Thursday. I had been idle the rest of the week. There was no shortness of timber generally; we might be short one day, on the next have plenty. I never noticed the want of ventilation; it would be stopped where the fall was. I cannot say that the ventilation would be wholly stopped. I came out through the return to the Abercarn Shaft. There was no want of ventilation, nor was there any foul air on the return when I last came out. We had quite sufficient air where I was, from Cwmcarn. I don't know of any other place in the long-work of which complaints were made as to the place not being sufficiently filled up.

By Mr. *Wales.*] It never happened more than once that there would be 12 feet left. That would be more likely to have a falling roof. I never saw any gas there. The only danger was from the chance of a falling roof. I never saw but very little scarcity of timber. We were guided by the state of the roof, as to where we placed cops.

By Mr. *Morgan.*] On the day of the fall there was a distance of 12 feet between the gob and the face. There were several places fell in when that squeeze happened. We saw signs of the squeeze coming, and we took up our tools and went into a safe place. Where these falls occurred I had just begun my own stall. It all fell in, heading as well. I saw no signs of gas, but I was on the upper side, and I should not see it. The fall did not stop the ventilation. I don't know whether the falls were cleared. On the Thursday I went to my own place to get my tools, for I was going to another place to work. There were men clearing the fall away. Henry Porter was there. On the Monday night, I commenced in No. 21, in the stall next to John Meredith. No. 21 was warmer than No. 17, but the air was as good, I thought, in the one place as in the other. The air was warm going into No. 21. I did not try for gas, it is no business of a collier to do so. If there were gas there, I should know it, whether there were light, or lamp or not, save if there were a very strong current of air. I walked through the return on Tuesday morning; it was not then warmer than usual. I saw no difference in it, but the return was warmer than my working place.

By Mr. *Ward.*] We had sufficient cogs to have put in, if we had had places for them. There must be more face in long work than in stall work, as we have to turn or swerve from the road. I have been a collier for 32 years, principally in the black vein seam. There was sufficient fresh air or wind to disperse the gas there. We got a quite sufficient supply of timber to work this pit with.

By Mr. *Morgan.*] There was too much space, that was what I meant by neglect.

By the *Coroner.*] I saw the fireman about four or half-past four a.m. I asked him the time, and he told me, on the Wednesday morning. I don't remember that any muck was left when the fireman left that morning.

By Mr. *Wheelhouse.*] By neglect in my place, I mean that there was not sufficient rubbish to keep the top up. I should say it was the night overman's business to provide sufficient rubbish. If he did not do it, the underground manager should be applied to. I told the overman, but I did not apply to the underground manager, when the overman failed. It is usual to wait for the overman to bring the rubbish before the next term.

THOMAS THOMAS, sworn; Examined by the *Coroner.*

I WAS a collier at the Abercarn Pit until nine days immediately before the explosion. The last day I worked was on the 31st of August. I left on that day, because I was afraid to work. That was because I had seen gas in different places. I saw too much, a great deal of gas. The first time I saw gas was in the hard-heading (No. 2). There was a good bit of gas there. I reported it to Miles Morley, the night overman. So far as I believe, Morley stood there all that night watching it. This was 12 months ago last June. Then I was taken ill, and left on account of illness. Then I was a fortnight idle, and I went back again, but not to the same place, and then I worked there till the 31st of August 1878. I did not report the gas when I left, but I had reported it just before. I reported the gas some four or five months since. It was in No. 4 where I saw gas, but I had not been working there for the five months last past. I saw Thomas Saunders watching gas with a lamp at the mouth of a spout-hole in No. 4, in Aberdare heading. It was a Davy lamp he had in his hand. He was told off to that place, at any rate, for a few days. I never tried for gas there. I left on account of being afraid to work, for gas. When I left, I was capital friends with the manager, and everybody about the pit, just as I started, for that.

By Mr. *Cadman.*] I worked in No. 4 for about eight months. The accumulation was in the face of the long-workings, not in the old workings. There was one stall which had fallen in below; there might be more, but I do not know of any. This checked the current, and so the gas would have a greater tendency to accumulate just there. There were no cross timbers in that place. Where I saw the gas was in Sychbant's heading. The stall had fallen, and the gas was working its way upwards, and finding its way over the facings. I was to go and change into Tom Three Horse Shoes. I saw the gas in my lamp. The fireman came at that moment. I asked O. Lovell if he had seen gas; he said, "No." He tried again, and then he said, "Yes, it is here." The fireman altered the sheet, and the place became clear of gas. After that, I went to another stall in Sychbant's heading, which had not fallen, where the ventilation was not good at all. The spout-hole was turned out of Sychbant's into Aberdare heading. I do not know that it was the same gas. The spaces were not properly gobbed up. The gob was pretty well filled up, and there was plenty of timber in

that place, too, and in the other place. I never worked except in No. 2 and No. 4 districts.

By Mr. *Wales.*] What I was afraid of was the accumulation of gas in Sychbant's heading from the fall of old stalls. I knew gas was there, because I saw it working up the faces. I did not see any gas later than seven months before I left. I believe gas was there, but I did not see it. Gas was working from the spout-hole towards Sychbant's heading. All the faces in Sychbant's heading fell, or, at all events, six or seven stalls fell. This arose from a general squeeze. I worked long work for the last eight months I was working. I saw more than one squeeze during those eight months. I cannot say there was gas the first time, but after that there was. There was a squeeze about two months before. They bashed it in several places. Twice out of three times there was gas following the squeezes. I did not see gas, but conclude it was there.

By Mr. *Morgan.*] After I left Sychbant's, I went to the spout-hole; then to Thomas Saunders's heading. I left there for No. 17, and then I worked my month's notice out. Fifteen or 16 left at the same time as I did. I don't know why the others left. I recollect about a wind-road, a very small one, too little to allow the gas to be carried off. This was in Sychbant's heading. I do not think I could get through that wind-road. I tried, but had to force myself through. Williams tried to open that wind-road for a whole day, but could not manage. David Rees, the overman, stuck in that hole five or six months ago. When I worked in Sychbant's the air was poor and bad; when I worked outside the stalls there, it was very good. In the five top stalls there was not enough timber. We gave our numbers to David Rees, and sometimes we got the timber, and sometimes we did not get it. After we had asked for timber; the places I have spoken of fell in for want of it. David Davis and John Gwyn were working next to me at the time I am speaking of; their stalls also fell in. We were scarce of nine-foot uprights. We had scarcely enough cogs there very often. I work in Gelanon Pit now, and the ventilation is much better there. I could not work in Abercarn with my clothes on, yonder I can work with my overcoat on.

By Mr. *Ward.*] I work now 300 yards from the shaft, but I do not know how far I was from the shaft at Abercarn. I worked in Abercarn for about one year and ten months. I worked before that in the Anthracite coal at Swansea. Before that, both here and at Rhondda. Waters was not working at Sychbant's at the time I was there. He was then a fireman. I did not report either to overman or fireman immediately before I left about this gas. I had told David Rees in the office that if we did not get timber, the place would be sure to fall in. He said he would send some in, but it did not come. This was a day or two before they fell in. There was great danger to me and my fellow-workmen in that place. I was in fear for the whole of the five months. After the spout-hole fell, gas was accumulating.

By Mr. *Wheelhouse.*] I first found the timber was insufficient when the stalls fell. An hour after a tram of timber came in. David Rees was with it, and he said "How is this"? I told him that the timber had just come too late.

Thursday, 9th January 1879.

JOHN OWEN, sworn; Examined by the *Coroner.*

COLLIER at Abercarn Pit; was working on the day of the explosion. I went down at 7 a.m. on the 11th. I worked at a heading in No. 2 district. Found all right. I worked till 12.30 (noon). I then came to the pit bottom. I have worked 16 years there. I have always found the pit safe. I have seen gas many times, but none to hurt, and it was all capable of being cleared in a short time, or bashed up. I never found it to be dangerous there. None of the men ever complained to me.

By Mr. *Cadman.*] I was in the pit, in No. 2 District when the explosion happened, right at the far end of No. 2. No one was killed in that district by the explosion. All we felt in that district was a slight blast of wind. I had worked two years in that district. We thought it was a large fall. All that district, so far as I know, was then being worked by long work. We had not opened our work sufficiently to take rubbish in, we had only just started to open it. This was the only place I had worked long work. I cannot say that I have never been short of timber there. The wind was always sufficient with me to keep it clear, and I never saw any gas in my place. I have not seen gas in any other place since I have been working on the coal there, but I do not walk about other miners' places. The black vein coal gives off a large amount of gas, being a very fiery coal. If the wind was not slow, we should not see much of the gas, but still we could and did see traces of it. The ventilation was improved in No. 2 Heading since Cwmcarn was opened through. Before I went to No. 2, I worked for about three months in No. 17 District. I never worked long work except in No. 2 District.

By Mr. *Morgan.*] I was a repairer before I was put on the coal. It is about two years since I began on the coal. I have not seen gas during these two years. I have worked two years, but only long work about 14 days before the explosion. Up to a fortnight before I worked "pillar and stall;" it was warm enough in my district.

By Mr. *Ward.*] There was sufficient air to carry gas away.

By Mr. *Wheelhouse.*] After I felt the blast, I went to the Dukey-road to see if there had been

been a fall. When I got there, I felt a lot of foul air coming towards me. I could not say from which direction it came. I could tell it was foul air from the smell. I returned to my own working place, put on my clothes, and came to the bottom of the shaft, through the Dukey parting and the return. Two or three men came with me. We discovered that an explosion had taken place when we got near the bottom of the shaft. We saw some boys and men burnt. I helped to get a boy out I carried him on my back, and he was got out alive, but died the following week. I saw traces of the explosion about 50 yards from the bottom of the upcast shaft. I saw two men lying near the stable door; they were not burnt, and they recovered, subsequently, from the effects of the after-damp. I was at the downcast shaft before I came up. There were marks of the explosion at the bottom of the downcast shaft; it was blown about. I thought the blast had come along the main Dukey-road. When I picked up the lad I could not tell from which direction he had been blown; neither of the men who were burnt said anything to me about the direction in which the fire came.

THOMAS SAUNDERS, sworn; Examined by the *Coroner*.

I AM a collier at Abercarn. I was working last in No. 4 District. I was last working on the Tuesday morning before the explosion (10th). I came out on Tuesday night, having gone down early that morning. I worked at the place for the last six years, both in Mr. Llewellyn's time and Mr. Jones's time.

By Mr. *Cadman*.] I worked in No. 4 for the last two years, with a short space between. I worked close to the parting. There was a stall only partially opened there, and there was a spout-hole towards Henry Russell's heading. I was, previous to that, working at Aberdare's heading. The wind was not stronger lately. Some places the wind kept clear, others not. It was for a want of wind generally in the district, as well as not carrying it round properly. The long-work facings were stowed pretty well. I had not noticed any places left open in the gobs between the two roads. I never was idle for want of timber; I have gone and got it. I waited sometimes for a week without timber coming to me after I had put my number down for timber. I had seen gas dangerous in my district. I saw it six months before the explosion in John Rees's road. On one occasion some of the stalls there had fallen in, and so the gas accumulated. It was the last day I was working at the Straight heading. Mr. Pond told me to cease working there. Rees told me to get sheets. I did so, and the gas was cleared out. Bethell came, and it was all right afterwards. Rees was there before me. I was hurt about a fortnight before the explosion, and had been off work on account of my back. I was told that I might make a start next morning, but I found the danger-mark there. Seeing the mark, I tried for about seven or eight yards inside. He said "the barber" was there, and I must be careful in and out. I was very careful. The left of my place, in Thomas Davis's place, six or seven headings off, led us to the spout-hole between the two headings; it was nearly filled with rubbish, but I could get past. There was gas inside. Waters knows, because he worked there. There was a sheet put up, a flying sheet by my work place, which made us turn up that way. I did not work there; I went with the fireman, John Harris, to examine Henry Russell's place. I left my little boy to keep anybody from going. Harry Russell's road was clear of gas, and wind was passing through the fall in plenty. They rose the plates out of my road. I wanted some plates and timber. I went into Jack Newton's road in search. I came back, and spoke to Ned the pumpman. I came out, because I found my own back would not bear it. I never was much afraid of gas. I have seen men afraid of death when there was a cap of half an inch on. I have been down since the explosion.

By Mr. *Morgan*.] When Mr. Pond told me to stop, the work has never been resumed. The last day I was there, there were no sheets, that was on the day before the explosion, where I and Waters worked; there was a spout-hole through to Henry Russell's, and the wind came along there. It was 6 feet when we drove it; we used 6-foot timber; it was 7 feet wide, we had not the same quantities of air after the spout-hole was stopped. Sometimes timber was brought into the pit, sometimes old timber was re-used. I was to go in 40 yards narrow; the first spout-hole was from 23 to 25 yards down. We used 6-foot timber; David told me what to do, and his orders were law to me, though I laughed at him; a wind-road ought to be from 4 feet to 5 feet at least; the wind-roads were not all that size; I have seen some smaller, and some larger; there were other wind-roads that had fallen at that time. There was another wind-road by Ned the pumpman's. I could get through there on my hands and knees. There had been a squeeze there, but it had stood before it came down to the ground. Poor Tom the stranger and another man worked inside that, toward Jim Bonny and Ned's place. They were opening the old heading, where I worked for an air-way. They had a framing up, I was told, making an air-way. I worked a bit in Gibler Morgan's heading; the wind came through to that heading from Sychbant's; there was a pretty good wind-road from Sychbant's to Gibler Morgan's. Alban's was afterwards closed. It is, I think, about five months ago; I saw it afterwards bashed up, but did not see the bashing done; I did not notice gas, but I saw cranes there for the purpose of clearing any gas that might come. Some part of Sychbant's was *partly* bashed at first, but it was *wholly* bashed three months before the explosion. I saw a bit of gas in a hole in Sychbant's heading, it was not much. I worked in Aberdare heading; there was one door only there when I left, and last saw it, but that was two months before the explosion; Aberdare heading was a "main" heading; I think there ought to have been two doors instead of only one; if there had been two doors there would have been a check, and therefore, a better supply of air where the one door was. There was bashing in Aberdare heading; this was put up about three months. The two bashings I put on the spout-hole, would be 10 or 12 feet each of them. It was a hollow place behind those bashings. Miles came with his men, and put another bashing up against mine, for gas was coming out.

This was on the lower end of the spout-hole. I have not been at Colley's road since that day when I turned the men out. The cross-cut was not there when I was last there, but there was one between Uriah Gover and James Matthews' heading. I sometimes, a day by chance, acted as fireman instead of William Waters. I have been sent for many times to see as to gas. This was the same place (Thomas's) as I had bashed up. James Cobs's working place was perhaps 30 or 40 yards from this bashing; I was there all day watching; Mr. Rud and David Rees were there all that day with me. I also watched an old spout-hole for gas; Harry Combs and Henry Prince worked there; I watched till 7 p.m.; the gas was dispersed as it came, by the air, for there were sheets for that purpose. I do not remember whether anybody took my place when I left. The colliers' road-ways were very well ventilated till the fall came in my heading. The roads sometimes get very warm, but I never saw gas in them; the double stall system for me. When I asked James Harris if I might take the mark down, he said, "no, don't, for I've not been past that place for the last two days;" Mr. Pond asked why it had not been reported yesterday; the overman said "No," because he looked on it as having been abandoned, but Mr. Pond said, "Not so, because men are working there or near there still." I know No. 4 Return; many times I have tried for gas; now and again I have seen a very small cap, but of no consequence; I never thought it unreasonably warm; I have felt white damp, but never in the Abercarn Pit, nor black damp either, though I have seen plenty of it. It was always gas I saw coming out of these bashings, not black damp; I did not think a 12-foot bashing was safe. Bashing is not so safe as filling up entirely. A collier might be working with gas above him and not know it, especially if he were working up to the white.

By Mr. *Ward.*] In the long stall system, pillar on one side, and gob on the other, is the plan. Rees, Mr. Pond, and the fireman came at this time, and everything was done to make all safe. There was no sheet there after the door was put up. I worked there for three months.

By the *Coroner.*] This system is more likely to cause falls than the other plan. I do not think the present system suits that seam so well as the one used formerly. They sent me, whether you call me a practical man or not, to do this bashing. It requires a man; I have never been doing that work alone without help.

By Mr. *Wheelhouse.*] (At instance of Jury). I do not think this system is as safe as the other. I mean "pillar and stall." I do not know that more rubbish would be required in long wall than in the double stall system, but in long wall I think the chance of falls is greater. George Edwards was the gaffer over the yard, and he used to go to the office to see the names put down for timber.

HARRIS WINTER, sworn; Examined by the *Coroner.*

I WAS a timberman at Abercarn Pit. I am now working at Pontypool in a pit there, at the same work.

By Mr. *Cadman.*] I worked in Abercarn up to the time of the explosion. I have worked there seven or eight years. I was a pucking-cutter at first, but have been timbering six or seven years. I was employed to keep No. 22 Return in repair. I had a man, if I wanted one, to help me. The return was always kept in repair. The least was six feet arms and six feet collars; some places were nine feet and six feet, but there were no places less than six feet in that road on the day before the explosion. As repairer I walked through the whole district to see whether anything wanted doing. I was never stopped for want of timber; it was let down, and then the horse took it to the place which required it. The air was always very good, till they changed the air; after they did so it was still good, but not so good. It was rather warmer after that. I worked on that return somewhere about two years. I never saw any sign of gas on that return. There was a smaller quantity going through No. 22 level (return). I never went into No. 22 district, nor heard any complaints of gas, nor saw any, nor did I see any in the return itself. I was working before that on 16 run.

By Mr. *Morgan.*] I don't know that there were any colliers working in 22 district since Cwmcarn was opened. No one was working there to my knowledge for the last two years. The plates were all down, and horses travelled with timber everywhere; through that district when I was working was as good as any other part. There have been falls, perhaps, one about a couple of months before the explosion. This was at the cross-cut, near the Baltic, a middling fall, the length of the fall was six yards, and it would take about a week to clear it away. It was cogged up to the very top, filling it all up. There was no empty space left. There were men cutting puckings there. I never knew one fall in the Baltic. It was warmer in the return than it had been before. I tried for gas, but never saw gas there. I found it very warm, so I put my lamp up to see if there were gas there, but I never saw any brown cap, till the old places were bashed up right through the level. I was right through the level, the night before the explosion. The overman (or fireman's) name is Charles Harris. I saw him there the night before the explosion. There were two cranes to turn the wind. It was not very warm in the Baltic. After the change the wind came down the dip, not up it. The men travelled in the main return.

By Mr. *Ward.*] I always had plenty of timber, but now and then we were short of timber. I had two lengths, six feet and nine feet. Some men had not the same chance, because they were working all sizes.

JAMES COLE, sworn; Examined by the *Coroner.*

I AM a collier at Abercarn. I was working up to the explosion, and for nine years before. I was in the pit on the morning of the explosion. I had gone down about seven a.m., but had not gone to work. I was at work on the Sunday night before the explosion, and had been working the week before the explosion. Ventilation was good. I did not find any gas.

By

By Mr. *Cadman.*] I was working last in No. 4 district, and in Thomas Rees's heading on Saturday. I had been working at No. 4 for a twelvemonth, or thereabouts. I was working in the stalls. On the Saturday a squeeze came all across the face. I had not noticed it before the Saturday. It was all clear of gas, except in another place. When the squeeze took place I saw no gas. Mr. Pond was there, and he tried it for gas. I kept back, as I was so ordered. We put timbers along there in less than half-an-hour. Some men were told off to see to our lamps, while some went to see all was right. Mr. Pond stayed there all the time. We did not work except to put timber up. In the morning of the Saturday we cut coal. We were ordered to come in on the Sunday night to see if anything wanted doing. I recollect a fall happening, and gas came out in consequence; when we were told to desist from work, we left our work, all of us. We did not report to anybody. There was more rubbish brought to us than we could conveniently stow away, and we grumbled. I have also worked in No. 18. I worked in No. 4 a twelvemonth.

By the *Coroner.*] Although I have always before reported gas, on this occasion I came out without reporting it to anybody.

By Mr. *Morgan.*] I heard a fall about a month before the explosion. I think the fall happened on the other side of Thomas Rees's stall.

By the *Coroner.*] (For the Jury). I went down after the explosion, and I found 11 bodies, all burnt. I could not say how the timber was forced, or in what direction.

By Mr. *Morgan.*] (In continuation). I saw gas near Henry Combs' place by the lower spont-hole. I cannot say where it came from. It came into the stall where I was working. This was three or four months before the explosion. There were places 40 or 50 yards from where I worked bashed up, or perhaps not so far as 40 yards. I think this was at the upper spont-hole. Combs's heading was off the lower spont-hole; the same place as Saunders mentioned. I only saw gas in my own place. James Wadly was working on one side of me, Combs on the other. Boys were working with us. I did not then see any falls. I went to the fireman and he soon cleared the gas away. On the Saturday, the gas was cleared off, I think, before we went away. At three o'clock I, Waters, and all the rest, came out together. On the Sunday night, when I went there, the fireman told us to take a Davy lamp with us, as there was gas in the workings. We never worked with a Davy lamp, except in dangerous places. On the Sunday night I put the rubbish into a face that had fallen. It had only squeezed a little, but not much. The face was close at hand. I expect this was ordered to be bashed up on account of the fall. I never wanted timber, nor did I wait for it. My place was well-timbered all the way up. We had timber brought to us, by the hauliers, on the Saturday when the squeeze took place. There was dressed timber used for cogs, but plenty was brought in a few minutes. The dressed timber was used because we thought the squeeze was coming. Mr. Pond told me to stop working there. I went in on Wednesday to No. 4. I was to have had a new place that morning.

By Mr. *Ward.*] When the squeeze came on the Saturday, Mr. Pond, the fireman, and another man, were all there, doing their best to check the gas if it came, and to clear it away.

By Mr. *Wheelhouse.*] The reason why I did not tell any one about gas escaping when I came out was, because I thought it unnecessary, as the fireman always goes round to examine the works before another shift goes in.

ENOCH WHITE, sworn; Examined by the *Coroner.*

I HAVE been a collier at Abercarn for the last two years. I was working there during all the week, and up to the night before the explosion. I was in No. 21 district, cutting coal.

By Mr. *Cadman.*] I worked nearly all the time, except a very little in No. 21 and No. 22 districts. I was working in a stall on a face of long work. The ventilation was not very good in the place I was working. I did not think there was sufficient air going up the face of the workings. I saw a large quantity of gas there. They were shifting the pit about six weeks before the explosion by altering the wind as to Cwmcarn, trying to get it to come from the Baltic, that is, through the Baltic from Cwmcarn, then, through 22 district, into No. 21 district. I don't think the wind was so good ever after that. There were two cranes put up to turn the wind up to us. I had no reason to complain before that of the air there. I never saw gas there before that in any quantity like I did afterwards. We were told that they were going to change the wind there that night. They told both us and the hauliers to go out there for that purpose. They never allowed the wind to go back again the old way. Some of the air came from Cwmcarn Pit, some from the other way. It was very warm there, and we were often talking about it among ourselves. When I saw this body of gas along the facings all the men had to come out. This was not caused by any falls, but by the change of wind. We found the change had made the difference I speak of, next morning. We did not go out of the pit, but sat down an hour-and-a-half. The fireman was sent for and came up, Henry Tyrrell. He and Guy, the overman, went up into William Games's handing and did something, but what I do not know. They were away about an hour-and-a-half, we were sitting down there all the time. They told us to go to work, and we went. I found it clear then. The gas was there about an hour-and-a-half. I did not think the place was so well ventilated after that. I saw gas on the Thursday week before the explosion. There was a fall between William Price, the man next to us, and us. The fall stopped the ventilation on the lower side of us. Mr. Bethell tried to put his lamp up, to discover the gas, and the lamp was put out. Mr. Bethell went to look for Tyrrell. He sent us out immediately on discovering the gas, and then went to look for the fireman. Mr. Bethell was head-overman. We waited a long time there, and then started out. He said, "Well, boys; where are you going?" we made no reply and went out. I cannot remember the overman saying anything else to us. We went in again the following morning. The hole was still full, but our working places were free of gas. We worked close to the gas all day. Mr. Bethell told

told us we must keep our lamps low, but he allowed us to go on working. Mr. Huxley or Jones went and took away a tram of coal. The fall was cleared, a sheet was put up then. Henry Tyrrell came next day and tried for gas, but his lamp was put out. We then left the hole, but till the explosion I saw no more gas. When Tyrrell's light was knocked out, he told us to get some timber. Up to that time there was not enough rubbish to fill up with. It would be from six to two yards from top to bottom which were not filled up. We were short of timber. The fall came down from the carelessness of the night overman not providing us with sufficient timber. My butty had been to the office three or four times for timber, but none had come.

By Mr. *Wales.*] I did not think there was so much air after Cwmcarn was opened, it being very hot there afterwards. When I was told to keep my lamp low, I tried for gas, but I did not do so after the fireman told me to keep my lamp low. The lamp was stuck on to a spike which was in the stick, about two feet from the bottom. The gas was not taken away after that. I worked there about 14 days after that. There was a fall about two yards away. This fall was at the heading of Wm. Games, but close to our road and work-places. That hole could not be filled up, being in the middle of the road. It was not possible to fill it up. I never found gas when it was fully stowed up, but I never tried for it. We tried in our own places only, not in the outside gobs. It is not usual to fill it up close. We were not paid for that. I was a little timid once, when that fall took place.

By Mr. *Morgan.*] Mr. Guy sent stones to us sometimes for filling up. Some one ought to bring stones to us. There were vacancies, wide ones; there was plenty of room for gas to accumulate. I do not know where an old man was, who was said to be loading stones for us. I do not know where they brought the stones from, but it was somewhere inside the pit. All of us did not go out that day, Mr. Bethell asked them to go back to work. In their own place there was some gas. The gas was within six inches of our place. The working place of the other men I spoke of was five or six places away from us.

By Mr. *Ward.*] I do not know where David Thomas was working, but not between me and the hole. William Price was next to me on the other side. He came out. I have been a collier for about nine months. I know the Market Tavern, and I have drunk many quarts there.

Friday, 10*th January* 1879.

THOMAS REES, sworn; Examined by the *Coroner.*

I AM a collier at Abercarn. I was on the night shift of the Tuesday before the explosion. I have been working there for about a twelvemonth. I am a witness, and represent the widows and children also. I have been working about six years at Abercarn.

By Mr. *Cadman.*] I came out about 11 the night before, having gone in at 2 p.m., on the 10th. I was driving a heading. I opened it to Richard Saunders's heading. I recollect the Saturday before the explosion. I was in my working-place on that day. I recollect a squeeze coming on that district that day. There was gas given off at that time. The squeeze was coming on for days before this. I knew a general squeeze was coming three days before this, from the Wednesday. I told David Rees on the Thursday before the explosion. David Rees was the overman. He is dead. I saw James Harris every day. I saw Mr. Pond there on the Saturday. There was nothing to be done. When a general squeeze comes, nothing can be done. My place was kept as carefully as possible. I always studied that. At that time my place was well timbered; it is no good to do any other, if you wish to keep it up. The gob was fairly stowed in my place. On the Saturday Mr. Pond gave special orders to timber up all the places as well as I could. I told other men the order, and they and I acted upon it. It was after our usual time when we come out on the Saturday. We stopped later in order to timber it up as well as we could under the circumstances. I went down again to my working place on the Sunday night. It was nearly all wrong, both sides had given way, the top had come down. The other roads in the district had fallen much. My road had stood better than the others; my place was better timbered and cogged than others. We kept our place better in that respect than colliers usually do. My place was open, so far as a tram was concerned, but a horse could not pass though the tram could. I put the place into as good order as I could, and was still doing it when the explosion happened. On the Monday the ventilation was not as good as before. On Monday there was not so much gas as on Saturday. Tuesday there was still gas there, though only a little. I might have found more if I had looked for it. The places were then a little settled. I knew there was gas, but I did not know of any other place but what I have mentioned. Every place to the right of my heading was bashed up; all the stalls except one; the one nearest to the face where the fall began on Saturday. I think the gob were pretty well stowed up, except one or two places. The stall was fastened up behind. There was a fault there; the coal was disturbed. The coal was going out and rubbish coming in. There was no current of air coming up that side across the old faces. There was Sam Toplip bashing. I did not think there was any gas working towards my place at the last going away. There was a bashing put up to prevent anything coming along the old airway. The places on the left hand of me were working. I never worked, except for a week, elsewhere, except in No. 21 district. I worked

No. 21 in January 1878; then I went to No. 4. I worked one week before January 1878 in Aberdare heading.

By Mr. *Wales.*] In three or four places, so far as I could see, the work was pretty well timbered up; that was as far as I could see. The general squeeze of Saturday had brought the top down to about a yard from the floor. There was gas there. There was a fissure or feeder, or blower, in the only stall left open on my right hand. Gas was coming every day, even after I altered the framing; this was from 15 to 18 yards off from me. The gas came up to my facing, but I do not think there was a cap of more than half-an-inch, and it was not explosive; I worked till half-past six on Monday morning. No one followed me in that heading: it was idle that morning for a few hours. I had authority to draw it. The mark was replaced by me. There was a little gas in the face of my heading that day. I found men at work when I went back. James Harris let the men go in at 11 a.m. I think the gas would be there then. I returned to my shift on the Monday afternoon at 2 p.m. I found a little gas there, it was in the top. There was a great crack in the bottom. We put a cog right into the other. It was thoroughly timbered. Mr. Pond ordered me to do it, and I put new cogs in, making them myself. On the Tuesday night when I left, there was gas, which smelt strong, coming out in plenty. The gas comes down from the top after a squeeze, from above the black vein, from about 30 yards above No. 4 or 5 veins, or, as they are commonly called, No. 3 in the workings. The air was worse on Sunday night and Monday morning, because of the great fall. The bashing is done on the side, and on the mouth of the heading. If bad coal did not come in there, there would be no fall. The bashing was put up to stop gas coming, or at any rate to make it as safe as could be. The bottom stall was about 40 yards, the upper ones less and less. My place was not too good a week before the squeeze, so far as the air was concerned. The reason I did not get plenty of air was, that the air was driven across the shortest cut. There was an insufficiency of sheets on the left hand. I could not have plenty of air in consequence of that. It was very hot, I had to work without my clothes. There was a good current of air at the top. If a fair portion of that air were allowed to come up, it would have been sufficient. I told James Harris that this body of gas ought to be kept more tight. If that sheet had been otherwise than as I advised Harris to place it, it would have been unsafe. There was an old stall next to my heading on the left, to which lately they have been taking rubbish to fill up, and there was no sheet there. That place was still being filled up. I do not think it was filled up then, as far as I could see. I do not think it was filled up at the back. I never tried whether air passed there. Of course, there was a door then, but there is no need for it now. When the crane was down, then gas came; I fixed it up more than once after the haulier. On my heading, there was one door up to Monday, then there were two doors after the Monday. I worked pillar and stall four years. We left about two feet of coal above us. The stall-heading was about 30 yards from cut to cut. We sometimes had gas there. I worked in many a stall, eight yards ground for each in twos; 16 yards for the two. I always worked under the chipping. I sometimes found a little gas there. The fireman would then sometimes put up a sheet to clear it away. I was working in No. 4 when Cwmcarn was opened I did not find any additional benefit by it, as to the air. In the stall-heading in No. 21 district, the air was coming across my heading, across the faces, and down through John Taylor's heading. There was a new place of working, from five to seven yards to the left of me. If the gob was back there would be no air, that is, if it were open to the left, for the air cuts off to the right, and if there were no sheet there to throw the air into that corner, I think the new plan would save expense, and would be a very good plan. Gas could not accumulate in the narrow heading, as it did in the wider ones.

By the *Coroner.*] I had orders to take the fire-mark down. I worked all through the shift, but I did not feel danger. I had not quite enough air to keep it from being dangerous, absolutely. Had there been plenty of air, there would have been no danger. Mr. Pond saw the "blower" himself. He asked "What is that"? I named it to Harris and the others. I had had timber sent specially to lay it up, and I did lay it completely, but that would not prevent the gas coming, if there were not plenty of air. Elijah Lewis told us to take the danger-mark down. He was night fireman and is alive now. No fireman visited me during that time.

By the *Jury.*] Have you been afraid, at any time, to work in consequence of the manager or any other officials not doing their duty? (Answer.) Perhaps the effect of it might be that. I was not very timid.

By Mr. *Morgan.*] There was not sufficient timber where the squeeze was. On the Saturday there was no timber to be had. I asked the manager what was to be done? I told him I had some near, and he told me to use, and I did use that, but I required a good deal more than I had. More timber was got together; men and horses were employed to bring timber, and they did what they could. If we want a stick, it ought always to be ready for us, that is as to supporters and cogs. There was a sufficient supply at that time in the yard, though there had been a scarcity, perhaps a week before. I knew Winter's and Saunders's headings. There was a great fall there, and had been for a long time. Rubbish was taken from this heading to fill up the gobs in the long work. It was taken many months from there by a man and horse regularly. The squeeze I spoke of was a general one, but there was only one fall, I think, then. It was sufficiently cleared for the officials' purpose. After the fall there would be a great vacancy for gas to accumulate. After the fall it would be abandoned. The fireman came through the places without exception almost every night, but he did not come through that night. Elijah Lewis was the fireman that night. The wind-roads in No. 4 were very bad, but have been better lately, but they cannot be very good, as they are travelling over and under falls in all cases.

By the *Coroner* (for the *Jury*).] The fireman, when anything was pointed out to him, did what was wanted. There are falls in the wind-roads to some extent even now. The wind-roads were not sufficient, in my opinion, to carry all the air that was requisite for so many men as were then working there. I saw gas coming

out of John Rees' stall six months before the explosion.

By Mr. *Ward.*] I think gas coming through No. 4 was mismanagement. There are double doors on Saunders' heading, turning air to John Newberry's heading. I would have a sheet on the top of both these roads. The fall prevented the air passing right along their faces. There was the fall and squeeze on the Saturday and Sunday. I would have stopped the men working. I could not have made any better arrangement. Waters and Davis worked after the fall, and Charles Endicott, John Mathews, Wm. Jennings, Thomas Davis and his son. All the places falling on the left-hand side of me were not fit to work in, because they must have made gas by their continuance. On the Saturday a great crack came. There was a gradual subsidence of gas. It was less in my stall. What there was elsewhere I do not know, but if little, and little and little continued coming, it must have been large altogether. I think, also, the management might have been improved by keeping better air-ways. The air-way passing from Newberry's to Wm. Waters' heading was not ample enough to carry a sufficient quantity of wind. From the Saturday there was no interruption of the air-ways from Newberry's to Wm. Waters' heading. The fall was not preventible, and before that, the air-way was plenty large enough from my place downwards. I cannot say whether the wind-road was or was not sufficient as it went in, except that it went through a fall. I do not think the wind-road in Aberdare's heading was sufficient for three or four months before Mr. Bethell asked me to bring men into Aberdare's heading, Toplis, Stevens, Ben. Philips and others, my orders were to drive a spout-hole between Aberdare's heading and Saunders' heading. I drove part of that spont-hole three or four feet high and six wide. That spont-hole, if struck through, would be sufficient to carry all the necessary air. I think the air-course was not large enough. On the night we made the spont-hole, Charles Preen was putting up a wooden door for the purpose of turning the air up to the face of Aberdare's heading, and it did so. If the air-way was continued, as I commenced it, I think it would be sufficient. I could not have done anything else than was done, but they could have arched it. Putting sheets up would not have filled up the vacancy. There was not one-tenth sufficient timber. Timber was brought as quickly as possible, for there was danger of all the workings coming in. Everything was done that could be done. We were sent in on the Sunday to bash, but it was too much for one shift to do. There is no doubt that other men also, besides ourselves, were put in to bash up, but I did not see them. I did not leave any rubbish on the face.

By the *Jury.*] I think this squeeze and this fall might have been prevented, for this reason: I told David Rees a week before, that he had better stop the places on the right-hand side, as coal was going out and rubbish was coming in. He said he wanted to drive in to see what was there. I do not consider long work safe in that seam. It might have been possible for some one to come into contact with those falls, and so explode gas. When I went to drive the spont-hole, four months before the explosion, from Aberdare's to Thomas Saunders' heading, I do not think that there was work for a week or a fortnight before in that heading. That shows that, for such work, the pit was in a bad state, so far as that district was concerned. The men were not allowed to go in; this was before Cwmcarn heading was driven through. I went down after the explosion on the 11th; I had been in the yard all day among the timber, making it ready, till about 11 a.m. Went thence towards home to prepare for going down the pit for the evening shift. I just came out and saw women running towards the pit. I heard a scream and I rushed out. As I came out, women and children were running down the road. I got to the colliery. I then found smoke issuing from the upcast shaft. The roof was blown off the upcast, and the other also. Billy the pumpman was trying to send water down the shaft, and I saw Tom Abbot and some other men climbing up trying to replace the roof of the upcast. Some men went down. Lewis Harris, Billy the pumpman, and John Harris went down the pit directly. I also went down later in the day. Mr. Pond went down with me, for, I think, the second time he had been down that morning. Mr. Pond told me to keep guard; to let no one go down by No. 2 engine house, or in that direction. I and Thomas Williams both stood together. There was a file of men, a great many carrying buckets. The water was to do'ut the fire in that quarter at the bottom of the pit. Miles Moseley came. A little boy was groaning by No. 4 engine house. Moseley took hold of the boy first. This was after I and Mr. Pond got down. The boy was brought to bank by me and two others. I went down to the bottom of the shaft at once. I went out of the carriage on 21 side, not on 2 side. I went as far as 21 engine house. I saw George Harris, the fireman, with a Davy lamp in his hand. He and some more men were seeing what they could find. I thought something was burning by the engine, or by the steam pipe, for I observed some smoke there. I went to see if there were fire, which we did see through cracks in the floor. We carried water, and put the fire out, George Harris and the rest of those who were there. Thomas Herbert, William Symonds (Billy the pumpman), Lewis Harris, Miles Moseley, William Waters, Charles Preen, John Harris, Charles Morgan went in the first carriage down. They found two dead bodies, which we brought up the shaft. I went down a third time to render any assistance, but I did nothing more. After waiting half-an-hour, I came up again. I saw nothing to throw light on the explosion, but the men seemed to have been blown from the direction of No. 21 district the other way, though it may have come from No. 17 district.

By Mr. *Ward.*] Before I went down the pit, I was working at the tin trade. I was reared up in the colliery from 7 to 17. Twenty of us were picked to go, and we did go down the Cwmcarn Pit. I found burnt bodies down there, I went about 800 or 900 yards into Cwmcarn shaft. The bodies are there yet. We carried some of the bodies part of the way outwards, and then we were obliged to leave them, because a second cry came of a likelihood of an explosion on that side. Thomas Saunders' boy was dead, David Thomas, and others whom I did not know. They appeared to have been killed in a moment.

By Mr. *Wheelhouse.*] I have not had experience of long work in any other colliery than Abercarn.

JOHN HARRIS, sworn; Examind by the *Coroner*.

I AM a mason, working at Abercarn colliery. I went down at 12.30, the first cage after explosion, and I was first out of the cage after we got down to the bottom of the pit as nearly as we could go. I scrambled down the guider for the last 20 yards. At the bottom of the pit there was wreck in all directions, and the knocker wire broke. The timber was blown from the direction of No. 21 district towards No. 2 side. We found one dead body close by the bottom of the shaft. I afterwards saw other dead bodies brought up to bank.

By Mr. *Morgan*.] I always worked at stone or brick bashings. I scrambled down, and I got down first, and stayed down, having got down the timbers, and I remained down till half-past 4, working till I was wet and wet through from water pouring down the shaft. I do not recollect any of those who were hurt making any statement as to the occurrence.

By Mr. *Wheelhouse*.] When I went down, the smoke and steam were cleared away. As far as I could see, the blast came along the return of No. 21 district, because timber and sacks of horse food had been blown from the return towards the bottom of the shaft. I stopped down alone after the other men had returned with the bodies. I remained down there till about half-past 4. Mr. Pond came down before I noticed that he was there, and Mr. Cadman got down about an hour after me. The men who came in from the hard headings were in such an excited state that they clambered up the guide-ropes to get to the cage. I was wet through before I came out. I did not hear the injured men make any statement.

OLIVER LOVELL, sworn; Examined by the *Coroner*.

I AM a collier at Abercarn. I was first down Cwmcarn Pit after the explosion. I had been at work the day before the explosion, on the day shift. I went down on the day of the explosion. I had come up the Abercarn end, on account of the place I worked at having fallen. I came out on the Monday owing to gas. I went down on the Tuesday working till 4 p.m. I came out at 10.30 on the Wednesday morning. I was working in No. 4 district.

By Mr. *Cadman*.] I worked in Thomas Rees' heading, in Colley's road, on the left-hand side going up. There had been a squeeze all the week. I did not see any gas in the faces before the fall, which happened some time between Saturday and Monday. We got to the mouth of Colley's road. The fire-mark was up, and we did not go in. The overman declined to go, but said he would send the fireman. Mr. Bethell and the overman came, took a sheet, put it up, sent the men in after doing so, and after staying there some time, they came and told us who worked in Colley's road, that we could not work that day, and some one told us to keep our lamps low, which we did. Gas was coming down very badly. When we got up to the Dukey-road, I found many men collected. I came out. I went down Cwmcarn on Wednesday after the explosion.

Monday, 13th January 1879.

OLIVER LOVELL; Re-called.

By Mr. *Cadman*.] (Who asked nothing further of the witness.)

By Mr. *Ward*.] (Mr. *Morgan* postponing his turn for the moment.) About 1 p.m. on the day of the explosion four of us went down first at Cwmcarn. We went inwards from Cwmcarn Pit, and along the shaft there. We went down for about 200 or 300 yards, when we first began to smell smoke, and saw some dust. We found a little coal between the pit and the top of the incline. We went as far as the bottom of the incline; when we got there we found slight falls. We saw a dram or half a dram of stone and coals. We found some timber about 10 or 12 yards above the cross-cut (parting), and then some other just about the parting; and three or four pieces of timber had been blown out there. The timber had been blown for about 12 yards. I do not think the framing of the cross-cut had been blown away. We found Rees Howell's body. I worked near William Waters.

By Mr. *Morgan*.] I worked on the Tuesday unloading rubbish. I commenced in Thomas Smith's stall. It was near Thomas Rees' heading, 20 or 30 yards from it. I suppose it was for the purpose of gobbing up Thomas Smith's stall, the place having been abandoned. That stall had fallen in some time between the Saturday and Monday. On one occasion, on the Tuesday, I saw gas there, very small but enough in quantity to put my lamp out, and it did so. The fireman was close on the spot. I think there had been a small slide in the top, which might have thrown the gas over the top of the fall. I think it was James Harris who was fireman. He came, and he went into the fall or gob as far as he could, I suppose to see what there was there. I fetched a light, came back, and everything seemed right. Harris told me to hang my lamp a little further back. This was done fearing that something of the same kind might occur again. I worked till 4 o'clock. Everything appeared after that particularly clear. There was a current of wind which was keen in that place, being narrower than in some places. There were several places near where I was working. These places were bashed, of course. About two months before gas was working through two or three

of the bashings. One or two mornings I found a little gas creeping out of a fresh bashing. I have known gas work through very good bashings. This would seem where the squeeze had not come; the bashings might be some time before they were made tight by the squeeze, but that would depend on how they were bashed. While I worked at No. 4 I do not think I ever came out on account of gas, except once, when we lost a week's work; but I don't know what for. The ventilation in No. 4 was very good some days, on other days not quite so good. Sam Toplis was working near me at one time. I drove through into a spont-hole on the lower side; it was the upper spont-hole. We drove by the side of the spont-hole all the way in. For 20 yards at least we drove through the loose brick work close by the spont-hole. We had one fast rib. The pillar was coal, very good if you have enough of it. There were no old workings then on one side of us. After we drove our way into spont-hole, it (the spont-hole) was bashed up. This was the only pillar between the spont-hole and our road. Gas would not be likely to accumulate if it were closed, but would do so between the two bashings, though I myself never saw any gas there. If there was any gas in the spont-hole, and only that pillar there, the pillar would not be sufficient to prevent gas coming from there. In No. 4, but not in my own working place, I have seen a lot of gas in that district (No. 4). The last time I saw it was on the Tuesday previous to the explosion. I saw it in Colley's stall. I worked in Colley's road some weeks before the explosion, up to the Friday night previous. After Friday night I went to the place again the day before the explosion, in order to inquire about my tools. I went into my place which had fallen; then I went to Colley's road. I went into Colley's place, and walked and looked up to the upper side which had fallen. I smelt the gas there very strong. It was rank there. I looked for my own tools. I found none of mine there. I went back and as I went Colley was filling a train of coal as I passed him. I stopped, and freshening my lamp a bit, I saw there was a cap on my lamp. I held lamp up, and it drew my light up so as nearly to fire it. I put my light up. I asked if fireman had been there. There were four working there at the coal. He said, "No." I searched for my tools and found none but a shovel. I went to my working place, unloading rubbish in Thomas Smith's stall. Colley and his partners were there working in the gas. About 10 a.m. on Tuesday, the "doggie" came to where I worked. He told me to go. I went into Colley's road to draw the rubbish for the men working there. Colley himself was not there then. The haulier came back, and went into same road as I had been in, He was in Devonport's parting at the same time as I was. While we were turning up the road, one of the boys ran back and holloed out to us to mind the sheet, and the haulier went on to the sheet and I stayed behind to close the sheet. The haulier went to open the sheet to let the horse through. Then I followed the horse. We were up there a few minutes. I went to Devonport's parting, back again, and when I got there Colley and the men all came back again from the face of Colley's road. Some one said "We've got the 'barber' here." I went on to the straight, tried my lamp. I there found the gas very strong, eight or nine yard from Devonport's parting. I left a man there sat on the parting between that and the sheet. On my way out, between that and Richard Saunder's heading, I met the overman, David Rees. I asked him whether he considered that place fit for them to work there? He answered, if they take care for a few days they would get a loose, and then it would be clear. I then therefore got back to my work, and I saw nothing of consequence that day afterwards. The distance was so short men were engaged in pushing; a horse could go, indeed one had been there. I know the sheet was there. It was fast on the top and one side. Gas would not accumulate in less than 10 minntes. We went through as fast as possible. It was not open a minute, only just while we passed through. I found gas below but not on the same road. I did not give any information to the fireman, although I saw gas in dangerous quantities. The workmen were doing what they could to open out a new wind-way.

By Mr. *Cadman.*] I cannot say what the fireman or overman did, but I went back and there were others working coal there. Colley was cutting. Other two men were next to them clearing in wind-road. They were clearing the coal. Four men were working in that road, Colley and three. Then above them were Thomas Waters and his son, clearing of the fall; above them was Dan. Williams, whose place had not fallen much into the road, but there had been a fall from his place into the gob; he took his work on to the face of the coal. Then John Hasland was working at Thomas Rees' heading. No one working on the heading. I saw him in Colley's road. Standing leaning on a stick. There was no gas there.

By Mr. *Wheelhouse.*] After I had made a communication to the overman I do not know what he did, but I know the men went to work next morning. In consequence of what I saw I made no communication to anyone but the overman. When I met David Rees I cannot say whether he had been at the dangerous place, or was going there. Where I saw him was about 30 yards from the spot at which I had seen a cap on my lamp. David Rees is dead. Nothing more passed between David Rees and myself than what I have said. Colleys' stall was dangerous, because of the gas being there. Andrew Ashman, John Marsh, and Joseph Williams went down with me in the first cage that descended Cwmcarn shaft after the explosion. I think the explosion occurred in No. 4 district, because men were found burnt in Michael's heading, and therefore I think the explosion occurred in No. 4.

WILLIAM COLLINS, sworn; Examined by the *Coroner.*

COLLIER at Abercarn. I worked at 21 district. I was down the night before the explosion at six p.m. I worked in Henry Knight's heading. I had only worked there that night. I worked in another stall in same district, night before. I have been working at Abercarnoff and on about seven years. I have found gas in No. 4 stall (John Adams') district. There was not more gas than came usually. I worked in No. 21 district five or six weeks.

By

By Mr. *Cadman.*] I saw no gas in Henry Knight's heading, nor in stall below. It was seven days before explosion. I worked with John Adams at long work. No other stalls in that face that I know of. There was a fall just above me on right hand. I saw gas on that side. I can't tell where it came from except it seemed to come along with the fall. It was coming, the wind I mean, over the fall to me. The gas would not explode in the lamp. It was simply a cap. I began five weeks before the explosion in that place. I was ordered to go to another place. Our road was about 20 yards. The stall-road was about 20 yards long from the beginning. It was stopped because the men above touched old workings. Fred. Clim; he is dead. He was sent from his place before the explosion. We were stopped Thursday before the explosion. I do not know whether any quantity of gas came off when we struck old workings. I was there at the time. I know there was gas there, and I knew it was there during the last fortnight I was there. I did not touch the old workings myself. Some days we had plenty of timber, and some days we were without. Sometimes my stowing was good, some times very much so. The last day it was so, we had been clearing the falls between our place and the place next to us. It kept on falling; we cleared it two or three times a day, we going on towards the old workings.

By Mr. *Morgan.*] I used a glass lamp; it was a Clany lamp when I worked in Knight's. Fred. Clim was working in the straight. He was using a Clany lamp. I saw no one using a gauze lamp. There were two falls in that heading. One fall occurred before the explosion at the beginning of the week. One fall was some days before the other. The first fall was never cleared, neither was cleared. Air had to come over the lower falls to me. At the top of the fall the wind was pretty strong, but not plenty of air to do the work. Before clearing we had scarcely any air at all. We made a place for the air to come. After the first fall there was gas in that place. The air was sufficient to clear away gas after we had made a place big enough. While gas was there firemen came to us. Terrell came to us. He sent us to the road. In a few minutes he called me into the place. He put me over the place to clear the way for the fall to come. I cleared it, and came out, leaving him there, and then he came out, and told us we might go back to work. The place was then clear of gas. The air had to go over the fall, over my place to Clinn. The fall above me was not cleared at all. We were all withdrawn, those above us as well as ourselves, We have had to go out when we ought not to go out. I then went to change Fred. Clinn in H. Knight's heading; we used a clanny there. I was changed for about 60 yards. I saw a fireman while I was in F. Clinn's place. He said, "It is right to work here." That was in reply to a question I asked him to that effect. He went on his way, round his work. That fireman was George Harris. I did not think it right to work there, or safe. I thought it dangerous, but not very dangerous. I thought the fall dangerous, because sometimes we had big stones rolling down on us close by the trains. I did not see any gas. I saw the overman and fireman on the Wednesday, the morning of the explosion. Lewis Harris was the fireman on that day. He asked who sent us there. I answered, "Joseph Guy." He then examined the place. He then said, when going away, "Take care, don't hang your lamps too high." I asked him if it was all the air we could get. He said, "Yes." I thought it was too hot there, and that there was not sufficient ventilation. I wish to say that when working in 21, I was one time, about three weeks before the explosion, short of timber. I had one road stick in my place. I put him up in the gob. The overman came back in about an hour after, and he ordered me to knock it out. I told him I must have more to put in before I knocked him out. He told me he would try to send me a tram full that day; but I did not get it, nor did I knock it out till the day after. No timber had been brought then. The fireman said there was timber. I and my batty went out and brought in three sticks, he two and I one. We stood those three sticks and knocked out the other one. We put them up before we knocked the other out. We could have used more if we had had it. Nothing happened for want of timber that I know of. We had a tram of timber sent to us a day or two after, but it was not often we had timber sent to us of our own mark. I don't know any fall for want of timber. Our gobs were pretty good. If there were gas there, there would be room for it to pass out into the other workings and roads. In the return, the air was very warm, but I never tried for gas there, about the air of this room where we are now.

By Mr. *Ward.*] I worked towards old workings on Thursday night. I have been a collier four years at Abercarn. The air was generally sufficient to clear away the gas.

By Mr. *Wheelhouse.*] I worked on the right hand side of Henry Knight's heading on the Thursday before the explosion. On the morning of the explosion I saw a danger-mark in the place where I had worked. If ever my lamp went out I never re-lighted it myself. I had to go to the nearest lamp station, about half a mile distant. The man at the lamp station had his own lamp open, the top being screwed off. No candles in the station. Palmer is the name of one of the lamp-men. I do not know the name of the other lamp-man.

[Adjourned till next day, at 10 a.m.

Tuesday, 14*th January* 1879.—Resumed.

Jury called over.—14 answered.

Mr. *Morgan* suggested that the evidence of Mr. Pond and overman and fireman be now called.

The *Coroner* dissents.

Mr. *Ward* says that such course would be inconvenient.

The *Coroner* decides to exhaust the colliers' evidence first.

CHARLES PREEN, sworn; Examined by the *Coroner*.

MASON at Abercarn. I worked at the Abercarne pits. I first went down, on morning of explosion, the Abercarn shaft.

By Mr. *Cadman*.] That was after the explosion. I worked underground for seven years last. I went down the day before the explosion. I was in the village of Abercarn where explosion took place. I ran to pit top and saw the doors at the top of the upcast shaft blow open, and I tried to put them right. The top hinge (which was a strap of iron) was broken. We fastened and secured the outside door, but did not go inside. I saw other men then covering the upcast. I got a bucket, and nails, and hammer ready to go down the pit. The pumpman went partly down the pit in the first cage that went down, came up, and then went down again with us to about five or six yards of the bottom of the pit. We saw a lot of men waiting at the bottom to come up, crowded round. They climbed on to the cage, and were brought to bank. One or two got off our cage and went to the bottom. I came up again, as I could not get off. We took a ladder down. Then went up on the No. 21 side. We saw Benjamin James, and found him burnt, brought up to bank, and he died during the day. We went to cross-cut, on the 21 side. Went to see if the doors were blown down. I found all three blown down from the return towards the Dukey-road. I then went through the cross-cut, looked towards the up-cast pit, and saw all the heading on fire. I saw Mr. Pond, and told him. He had come down by that time. They collected water carriers. Mr. Pond put me to mind that no one went along 21, on the intake towards 21. I remained till ordered out by you, Sir, quite in the evening, when we all came out. On the mouth of the cross-cut there was a feed-box for horses, and a whitewash tub; they were both blown out from the cross-cut on to the Dukey-road. It seemed to me as if the blow had come from the return towards the down-cast pit. The culvert on the intake in which the rope worked was all blown up. I could not say which way the culvert was blown, but I thought towards the down-cast pit. I don't think any blast came from the Dukey-road, but all through the return. All the place was blown about by the explosion, as far as the cross-cut, and I saw a hole beyond that, but Mr. Pond went first through.

By Mr. *Morgan*.] My duty was to put up doors, not sheets. The door in Taylor's heading was like (*place pointed out*) David Hughes' heading that was. The distance would be about 10 yards between that and the return. I have never been near that place when it was open, but the door would not stand open by itself. I was working in that district. The crane would be as good as a door. I never saw frame broken.

By Mr. *Ward*.] I must have seen it broken if it had been so. I went round the pit twice a-week to see all the doors right. Mr. Pond and Mr. Cadman were the first to go down towards 21 intake. I was told off to prevent people going that way. I can't say that a blast came up the intake.

By Mr. *Wheelhouse*.] I think everything was blown towards the downcast shaft. Benjamin Games, fireman, was burnt all over. He was lying on the handles of the engine, and his head leaning towards the downcast shaft. I think he was blown from the cross-cut, from the position I found him in. He was not sensible.

HENRY RUSSELL, sworn; Examined by the *Coroner*.

COLLIER, at Abercarne. I worked on the Tuesday morning before the explosion.

By Mr. *Cadman*.] Thirteen years off and on, three out of it, 10 years in the last 13 at Abercarne. I worked in No. 4 district, day before the explosion. I began between 2 and 3 p.m. I had gone on Wednesday to get my lamp to go down. The squeeze came on; because of that, I could not get to the place I worked at. I worked in Aberdare heading, in a stall on the left-hand side. It was the bottom place, newly turning off by Joseph Jones's place. I turned on the second, the first was finished. I was working in Joe Jones's place. I did not notice any squeeze in particular before the Tuesday. I have been working in No. 4 district about 12 months.

By Mr. *Morgan*.] Between Sanders' heading and Aberdare's heading, when I last went there, I had to go almost doubled. The ventilation was very warm where I was working. I was working near old workings. The place was very warm that morning, my shirt was wringing wet. My partners worked there with their shirts off. On Tuesday I worked all day without being stopped. On Monday William Rogers, who was working in the other heading, was sent up by David Rees and Mr. Bethel to fetch every one of us back to the Dukey parting, Oliver Lovell was there at the time. I saw no gas in my place on Tuesday. I saw others go to their working places on Tuesday as usual. I have not seen any of the men who were working near me at that time, since that day. I have been twice stopped by gas in my district. Two months before explosion and four months before explosion.

sion. I passed two or three sheets going to my work along Aberdare heading. They were placed by some old roads that had been bashed up. I would think they were so placed to turn air up against the bashings to clear gas working through the bashings. There is an arch in No. 4, within about 10 yards off the heading, from which I turned off (Tom Sanders' heading), about three weeks before explosion; I was sent for there to clear out a couple of trains, forming part of the arch that had fallen. The trains had been catching in this arch for some weeks before. I was told off to see that the arch did not fall when the horses were travelling. I put up what timber I could to prevent it from falling; but I could not do much, and I stopped there till a man was sent to change, and he timbered it. It was a very narrow arch, so much so, that the trains caught both sides. This was from three to ten o'clock in the afternoon. It was timbered safe next day.

By Mr. *Ward.*] I can't say whether the air has been increased very much. There was a furnace, then a dumb drift was driven. Then a fan was put up.

By Mr. *Morgan* (with leave).] I had worked up Tom Sanders' heading about a month before the explosion. There was gas there, and I had to go out in consequence. There was a good bit of gas there; it came out of the top. It was cleared away during that time. Then a wind-road during that time was driven, and the gas was cleared. I was working in Mr. Needham's time. I believe the roads were in better repair then than they are now. I can't say what weight I can now fill; but nothing near the weight I could when I first worked at No. 4.

By Mr. *Wheelhouse.*] The hauliers complained that the trams were too high. I have seen trams broken through being overloaded. When I last saw the arch it was safe and wide enough to permit of trams passing through without inconvenience.

CHARLES ENDICOTT, sworn; Examined by the *Coroner.*

COLLIER, at Abercarn, No. 4. For the last two years and half, on shares on, and on wages. I was working off John Colley's road, on Saturday, when the crush (squeeze) came. I saw a little gas.

By Mr. *Cadman.*] I was last in the pit Tuesday night, coming up about 11 p.m. I had been in on the Saturday before explosion. On the Saturday Mr. Pond just happened to be there when gas came down all along the face. Then Thomas Rees halloo'd down.

By Mr. *Morgan.*] There were falls in my face, Daniel Williams and Henry Williams' place; but Henry Williams did not come in. Thomas Rees was working 20 or 30 yards off me. On the Tuesday night I was clearing the falls, Thomas Davies and William Waters were working below, changing with Colley, and cutting coal down below. There was a sheet put up in William Devonport's parting to send air down to William Waters. Our air came over the fall from Henry Williams and Daniel Williams' place. I kept my lamp low and back; I never tried for gas. The sheet was weighted, and the stones were removed as trains went through. I went into Thomas Davis' place on Tuesday night; I looked for a shovel. Davis' boy was working in the place, and I saw him once by the sheet, because the haulier did not put the sheet right.

By Mr. *Ward.*] Rees was working in his own heading. I began to clear it as soon as I got in, having previously heard that it was clear, but I found it had fallen. Daniel Rees came in and I told him that it had fallen in again. He said it is all safe, go on; and I saw no gas. Rees went, came back, and told me to go on; no further danger. All settled, and was safe again after the prop broke. I was working to get new turn made.

THOMAS WILLIAMS, sworn; Examined by the *Coroner.*

TIMBER-MAN at Abercarn pit 13 years. I came up the day of explosion. I went down to timber on the Tuesday night about 6 p.m. I was timbering by H. Russell's stall wherever I could see there was any wanted all about there.

By Mr. *Cadman.*] I have worked in No. 4 district. I was timbering the airways back. Henry Russell's place was then quite safe. I did not see any gas there. I came out through the Dukey-road on the Wednesday morning. I met Henry Russell at top of pit. I was alone when I met him. So far as I saw that district (Aberdare's heading) safe that morning, and free from gas. I was there the Monday night before explosion. Most of my time timbering between 4 and 17. Monday night was the last time I was there. We could take a tram and horse right through to No. 17 district. Six-feet collars and six-feet arms was what I put up in the shape of timber. It was all clear that Monday night in the return. I know No. 4 walking in and out. I never went into any working there. It was not my ordinary duty to go timber in Russell's place, but I was told to go; Russell himself was not there. I went to Russell's place in the evening, but at what time I don't know precisely. I saw Thomas Deerfoot and William Williams driving rubbish towards the upper stalls and backing it into the gobs. There was no fall on the Monday night when I was there last. I know nothing about the Tuesday night falls, for I was ordered to go to another place, and therefore could not go. I went to my regular place and worked there, and if called on, went anywhere else I was told specially. Thomas Sanders was helping me. In Thomas Sanders' some little gas came out and we put up another bashing in support of Thomas Sanders' previous bashing, sufficient to keep it in. We had sufficient timber for the purposes of this mine.

By the *Coroner.*] I worked from 7 or 8 p.m. to 4 in the morning at Russell's stall. I did not feel it very warm there. Fireman called twice that night, Elijah Lewis. We timbered it all safe before we left it. We were filling up spaces that colliers had left unfilled up. That took up our

our time. We were also (some other men and I) cogging up. William Williams, Henry Matthews and Walter Rees were working along with me; I was the only timber-man there. I overlooked the other places but only timbered Henry Russell's stall myself. I saw them all put safe.

By the *Jury.*] As to No. 4, the numbers who timbered were E. Llewellyn, George Tudor, and a man named Stanley, who came in place of Thomas Wailes. I was not sent back; the timber was there. I timbered all up to Russell's place with the aid of another man. I cannot tell how many sticks I put up. I have had many things to recollect since then, and I really can't tell you. I was moved about from place to place as I might be wanted. I was generally employed in timbering from No. 17 to No. 4 district.

ELIJAH LEWIS, sworn; Examined by the *Coroner.*

NIGHT-FIREMAN at Abercarn pit for last five years. No. 4 and No. 17. I have been all these years there. I was down by 6 p.m. on the Tuesday, the night before explosion, and came up at 5 a.m. Wednesday. I went into my working place in those two districts during that night. That was my duty. When I got to the surface I wrote a report. I did so at the office in a book kept purposely. I meet the day fireman every morning at the office.—(*Report read, true.*)

> "I beg to report the whole of the workings free from gas and falls, according to Rules No. 2 and 3.
>
> *Elijah Lewis*, Fireman."

However small the quantity of gas, unless I have cleared it away, or seen it cleared away, I always report it. All the workings were wholly free on the Wednesday morning. I found a fall in the stalls in Colley's and Thomas Rees' road in the face between them. There were two or three stalls fallen, but only a little bit. There was a little bit of gas in Colley's and also in Thomas Rees' heading; in a hole there was a cap; very small one, however. The first time I saw any disturbance (of a squeeze, that is) was on the Sunday night. On Monday morning I reported a little gas (*see* report). I gradually go round all the working places in the pit, beginning with No. 4. Generally, except I be called elsewhere, I examine some places by 7 or 8, evening, sometimes again in the morning, but not always, unless there be something serious. If there be nobody there in the night, they may not be examined again that day. There is an overman also. He always goes round after me. There is an overman and fireman for each district both night and day. On the Tuesday night it was all right; indeed from Sunday night to explosion. I speak of No. 4 and No. 17 when I say that. When I came out on Wednesday morning it was all safe. Cwmcarn heading being opened, the district was much better as to air and ventilation. In 17 there was a sight of difference. In 21 there was quite sufficient air to dissipate all gases. I have been down since explosion. I have been as far as they have ever gone since explosion, about 400 yards from pit bottom towards No. 4 district. It is cleared nearly half way. The whole length being 900 or 1,000 yards. They are clearing both roads in Main Dukey-road, the road itself and return; the wind was still going in front of us both return and intake. I can't say which way the timber has been blown; indeed there is no sign of explosion there, either in the intake or return in No. 4. I have also been in No. 21 Dukey-road. There all the timber is burnt. I think explosion took place in No. 21 district. There were timbers burnt along the Dukey-road. The fireman was called Miles Moselly.

By Mr. *Morgan.*] The night before the explosion I did not see Thomas Rees. I was called up to Aberdare heading (first beginning of the time) to cog up there. I was up there about an hour. I did not see William Waters that night, or Charles Endicott, or William Gurnays, they were all gone out there when I came back. I went to the heading of Thomas Rees about 12.30 midnight. The falls were not completely cleared on Sunday night, but anybody could travel over them, and quite plenty of wind coming over the falls. If there were a large fall we should report it more than once. General rule was to report a fallen stall once only. If we once put up a firemark against a place, we should report it every night and morning till it was cleared. We should report it or bash it off. When there was an abandoned place we were in the habit of bashing it off, if there were gas there. The last time I did it was about three or six months at Morgan's heading, and we also bashed off spout-holes since then. Since then we bashed off four stalls in Thomas Rees' heading three months before explosion. There were two or three sheets placed in Aberdare heading. We put up four sheets as a protection in case gas or squeeze came, and it stood there while it became solid. These sheets had been there a fortnight or three weeks. We bashed up the spout-hole about a month before the explosion, three weeks or a month before. Thomas Rees was bashing up William Brassey's stall the week before. Sometimes the places bashed up contained gas, sometimes not; it might be precautionary. I remember five cranes at Syckbant heading; the wind came through No. 17 to No. 4 return. I did not put a firemark later than the Sunday night, when I put one in Colley and Rees' road. There was a danger mark up in Thomas Sanders' heading. We kept the danger-mark up though there was no need, often in order to keep the people out. There had been a fall, and they were clearing it away as fast as they could. It was some time before that it had happened. That fall was reported many times. They were engaged clearing it away every day last week. There were three men on one side and two on the other side clearing this job, employed there constantly. There was no gas in the cavity where the fall was. This was a straight level. The fall was 30 yards long. I should think it was a fall of 14 feet high; the fall was 14 feet from the top up to the plate. I tried for gas on the top of the fall. It did not continue to fall. The men stood timber there on the day of, and before the explosion. They were there clearing and timbering constantly. I do not know of any fall in Thomas Sanders' heading under which we had to go. I know where Shepherd was working. He ripped top coal to meet the other two men. He had to rip down a great lot of top coal before he could get to them.

I saw

I saw a half-inch cap on my lamp up in a hole in Thomas Rees' heading in a crack there. There was no gas at 12.30 when I went Tuesday night, nor was there any on Monday. I told Thomas Rees to take down the fire mark and to work there. I sometimes order the danger-mark to be obliterated when I know it is safe. I told the man (Rees) that there was a little bit of gas there, but I also told him that I did not consider it dangerous.

By the *Coroner.*] I was quite justified in telling them to take away the danger mark with so small a cap on. I was in Lovell's place on Monday, but there was no gas after Sunday night. The daymen cleared it on Monday. I do not know why the men did not work on the Wednesday morning. I went to Lovell's stall at half-past 12 or 12.45 midnight. The day fireman came in after the day shift came in.

By Mr. *Morgan.*] I measured the airs in my district every morning in No. 4 about half-past 3, sometimes it may be 5 o'clock, in No. 2. Fifteen thousand feet a minute ventilated Sanders' and Aberdare heading, and then the velocity of air per minute is 450. The area of the measuring station is 34 feet. The measuring station 42 feet area; velocity of air per minute 820; 32,800 cubic feet in the district. In 18, 42 feet area, velocity 740 feet, cubic feet 17,040. The overman made these entries. I was there and gave them to him; velocity of air (9th September) 410 feet, cubic feet per minute 13,940.

[Adjourned till 10 a.m. Thursday next.

Thursday, 16th January 1879.—10 a.m.; resumed.

Jury called over.—14 answered.

ELIJAH LEWIS; Re-called.

By Mr. *Morgan.*] I was fireman for Nos. 4 2, 17. My duties in examination ordinarily took me about five hours for the round. I got to the pit at 6. I put a danger-mark if needed; if not I merely put the day of the month. If a collier were working there I should put no mark. If a collier were working there in the afternoon shift, he would work from 2 to 10 p.m. If a collier were working there, there would be no mark placed there before the collier next on the shift would go on; assuming no workman came to work next shift. If there be no danger, the fireman would put the day of the month, unless a collier were working there, and then no mark would be put up. I do not know when the day fireman would start. It could scarcely be possible that there was any case without the examination and inspection of a fireman from 7 p.m. to 3 p.m. next day. No. 4 took two hours to examine. It would be finished about 8 o'clock. I finished about 11 p.m. I came back to No. 4 after that. I stayed supper in No. 4, and remained there for about an hour. Then I went down the wind-road to No. 2 side. I got to No. 2 about 5 a.m. That would be the first time I got there that morning. When I examined No. 4 there was wind turned in by sheets to Tom Saunders' and Harry Russell's heading. There were danger marks then. I inspected the inside of that place. There was no fall, but the timbers were squeezed out there. I never heard Saunders nor anyone else say there was a fall there. I did not notice gas there. There was a wind-road there, and I travelled through it every night. I think there was a danger-mark on each of Saunders' and Russell's headings. I went in through Russell's, out through Saunders' heading. I went through as the air travelled, and I could get through from one to the other. The wind-road between Saunders' and Aberdare's heading was 6-feet collar by 9-feet arms. I travelled through that place on the Tuesday night; it was repaired by Isaac Shepherd and Thomas Stranger about three months before. Shepherd was working in Saunders' heading. There was no fall in the spout-hole, or wind-road between Saunders' and Aberdare's heading. Shepherd was ripping top coal Therewas not any air-way that I could not go near the fall by Saunders' heading. Anybody could pass over the fall very easily at any time the top coal. The squeeze did not actually come very low there. The wind goes round the face of Aberdare's heading (*see* 72). I went there twice that day, because I had men cogging in Henry Russell's place. I went through the top stall that was working as the air went. There were two stalls higher that had been abandoned for three months. William Brassey was working at a stall at the top. The air went by way of intake, through Brassey's stall. We had a sheet on the road close to Brassey's. The top stall of the two was bashed up. The other was left open for the wind to go round. There was a sheet on Davy Edwards's which would turn the wind up. We sent the air to keep the old workings free till they could bash them up. through. The least was 4 feet square. I passed through every air-way every night in No. 4 district, whether there were a fall or not. On 6th September in No. 4 district, velocity per minute was 19,380, on the 7th, 16,200; on the 8th, ——; ontthe 9th, 13,940; on the 10th, 17,000; on the 11th, 15,300. The air station is below the two returns at 3A on the plan. I took the number of revolutions by the anemometer; I stand on one side holding the anemometer in my hand.

By Mr. *Ward.*] Every air-way on the night before the explosion was sufficiently large, and there was no obstruction in the air-ways throughout No. 4. I passed all through. After Monday we could pass over the fall between Colley's and Rees' roads, and I did so. There was plenty of ventilation all through No. 4. I tried all the places carefully, and found them all free from gas after the Sunday. Plenty of air passed through the old rubbish stall to ventilate the whole district. Between 8 o'clock at night and 3 a.m. I was continuously in that district, and 17, except I was called off for some special purpose, but I should make one systematic inspec-

tion, and if I think there is any danger I go twice, and I take all needful steps to put any disturbance in order. Henry Russell's place was properly timbered under my inspection, by 4 o'clock that morning. I went there twice and saw it done. There was a general squeeze in No. 4 district. The ground was settled in Colley's place on the Sunday night. I have been working in Abercarn Colliery continually 17 years. The ground was settled by 4 o'clock on the Wednesday morning in Henry Russell's place. I do not think the squeeze interfered with the ventilation in Colley's or Russell's places after the Sunday night. The roads are much the same now as they have been all the time. Every care has been taken to keep the roadways in good order and repair. I never had any complaints of warmth, or insufficiency of air. If there were not a danger-mark any workman would gather that his working place was all safe. I always entered the result of my inspection in a book. So far as I know I have always had a proper supply of timber for this mine. I heard Henry Russell examined. I find the wind-roads as good as they were six years ago. There are more wind-roads now than there were then. Henry Russell was working in No. 2, up to about 12 months ago. There are three overmen in this district. I examined No. 4, 17, and 2, *i.e.*, by night. Miles Moseley is night overman in that district. He goes up to No. 2 first. I then meet him in No. 4. Andrew Ashman is overman in No. 17. Ephraim Watkins is overman in No. 2. This area was not very much for the men to do. The overman was not always there. I took the number of revolutions, and they were worked out by the overman in the office. I do not know what timber was used in Henry Russell's stall that night. While I was away supping Ephraim Watkins would be there.

By Mr. *Wheelhouse.*] John Morris, John Marsh, and John Dart, colliers, worked at Abercarn before and since the Ebbw Vale Company had the property. They are all now alive. No one has told me that the colliery was unsafe. There are three shifts every day. The air is quite fresh during the 24 hours. I dare say the air would be cooler and purer if there were not three shifts. Repairs go on from 10 a.m. to 6 p.m., whilst the colliers are absent. A Davy lamp is used in some cases, and a Clanny in others. If the top of a lamp were damaged by a fall it would be sent out to one of the two lamp stations. I always sign my reports myself. I did not stop colliers from going to work when danger existed, because the day-gaffer would put them into another place. If I met them I might tell them of the danger. I trusted to the danger-mark and to the report, as a rule.

Mr. *Wheelhouse* to *Witness.*] So long as you are an overman, if you find danger, never again consider that you have done the whole of your duty by simply putting up the danger-mark, and making a report. It is your bounden duty to tell the men as well.

The witness added, in reply to further questions by Mr. Wheelhouse, The last time I noticed gas before the explosion was on the Sunday night. I have found a lamp in the pit unlocked. Occasionally a lamp would be sent down the pit unlocked. Perhaps one in six months. I examined the colliers for keys, pipes, and matches. I never found any men with a key, nor have I found a key where one ought not to be. I never found matches in men's pockets, but pipes I have twice found. When I found a man with a pipe I handed him over to the overman, who sent him to "bank." The man who was thus sent up was not allowed to come down again that shift. No. 4 was the only part affected by the squeeze just before the explosion, that I know of. As far as I know, the colliery was free from all danger when I came out on the morning of the explosion. I had not any key to my own lamp. All I had was the pricker with which to regulate my light. I never lighted any man's lamp by my own lamp. The colliery would be without a fireman for an hour and a half in the morning. The repairing shift went down at all times between 6 and 10 p.m., but they were put to repair the back windroads until the colliers left work. I used to see James Harris, the day fireman, before I went down, and saw his reports. If there were any place in danger I always went to that first, and tried to put it right before any men came to work. If a lamp was found defective, it was sent out. I put a danger mark on the Sunday night before the explosion, and James Harris did not allow the men to go down. It was not reported, because the danger was removed in the course of Monday. When a lamp gets clogged it is cleaned by a man at the lamp station.

[Adjourned till 10 a.m., Thursday next.

JOHN MARSH, sworn; Examined by the *Coroner.*

I AM pumpman and overman at the Cwmcarn end of Abercarn works. I have been overman three years.

By Mr. *Cadman.*] I was down Cwmcarn pit on the day of the explosion, going one of the first after the occurrence. I and four others went down first; then we knocked for others to come down. I had my attention called to the creaking of the fence round the Cwmcarn heading, or bank of the pit. I mentioned it to the other men on bank. I heard a sound, but nothing in the shape of a great report. I saw dust and chips come up in flight, up the framing. I only heard one sound. We got steam up at once in preparation; that took about 10 minutes. I wanted to go down, but the engineman would not let me do so for about an hour. We first heard from Abercarn that there had been an explosion. I got a lamp ready for going down. I sent the cage up immediately, because I did not want more men at first than necessary. I went down the first heading. We made our way towards No. 17; there we found three bodies, two of men I knew, John Games and Rees Howell. There was not a great deal of fall. I could not get along, for there was an immense amount of thickness of fog and after-damp, which prevented me from getting into the stall roads. I could not form any opinion as to which way the "blower" had come. I went down to the same place a second time that day, into Michael's heading. We saw three bodies there also. I saw traces of burning on the timber; the collars were burnt a good bit, but I did not notice on which side they were burnt. We did not go further in. I kept guard while Mr. Pond went on to explore; that was for about another

another quarter of an hour. After the inundation I covered the top closely at Cwmcarn, and measured the outflow of gas nearly every half-hour. Notwithstanding that water filled up the Abercarn end, great volumes of gas came up to the top of the pit. The fencing round the mouth is about 20 feet square. I cannot give the quantity of gas, but once we had something like 700 feet per minute.

By Mr. *Ward.*] The body of John Lewis was the only one brought to bank at Cwmcarn. I have been working at Abercarn for 28 years, boy and man.

By Mr. *Wheelhouse.*] I was away four years in Mr. Llewellyn's time. I was here before the Ebbw Vale Company, Limited, took the property. Mr. Rogers was the lessee when I first went there. He was followed by Mr. Blackwell and Mr. Dickenson. From the time I first knew the colliery I don't know of any difference in the management. Before the Ebbw Vale Company took it there was an explosion in No. 3 seam. Only one boy was killed. There was only one shaft then. I have not heard any complaints of mismanagement during Mr. Pond's time. I have known men go away on the Monday, and want to come back on the Saturday. I have not heard any complaints of increased danger in the past few years. I have not had any fear since a part of the pit has been worked on the long-work system. The Cwmcarn cage has never descended since the first day. Gas is still coming up the Cwmcarn shaft. I have not worked in the pit for the last three years. The best and most careful hands were employed doing the repairs. No one has complained to me of want of ventilation or timber. The pit was kept fairly free of gas, and as safely since the Ebbw Vale Company had it, as before.

Friday, 17th January 1879.

JOHN MORRIS, sworn; Examined by the *Coroner.*

I AM a collier at Abercarn, and I have been from 30 to 31 years there. During the whole of that time I have been three years away; nine months in America, and the rest on strike.

By Mr. *Cadman.*] I was working in No. 2 at the time of the explosion. I was down pit on the night before the explosion, working at the hard heading. I have been a collier all the time. I went down Abercarn pit twice on the day of explosion. My first descent was an hour or an hour and a-half after the occurrence. I never was down Cwmcarn.

By Mr. *Ward.*] I worked at the Black Vein upwards of 20 years. We worked with one shaft till the Ebbw Vale Company took it, and they ventilated with a small fan first, then with a furnace. The ventilation is much better now than at first, or 20 years ago. Since Cwmcarn pit was opened, still better. I have worked under successive managers. The roadways and air-ways are quite as good now as they have ever been. I have known a sudden outburst of gas from coal. perhaps as many as four times. The first was in the main return level for No. 21 district, about 20 years ago, when the Black Vein was beginning to be opened. This was 40 or 50 yards only from the pit. John Dart was in at the time. The next was in No. 5 deep heading off the main Dukey-road leading to No. 21. This was 17 years ago as nearly as I can recollect. I and my brothers and my brother-in-law were working in the deep when the "blower" went off. It brought down coal and gas till it got into the return, where the air cleared off the gas. We retreated. It filled up the return. The third time was in No. 11 heading, off what is now the main return of No. 21. I struck it myself in the heading. We had soft coal there. We had finished filling all the trains we had there then. We were working eight hours' shifts. It was 14 or 15 years back. I told them in the other stall. I was cutting a post-hole for timber, when the blower came and knocked me down. John and Henry Davis and my brother William ran to the spout-hole. I got myself free and came away. Some small coal fell upon me. We have always worked with locked lamps in the Black Vein. The fourth time was in No. 4 heading (No. 2). This was 12 years back. I struck that blower myself. When blowers come, they come out of soft coal. Before the outburst the coal cracks and cracks, and then the blower comes out with a noise like thunder. When the blower had gone off, we all came away, I telling the other men. If there had been a bad lamp there would have been an explosion. I have always had plenty of timber.

By Mr. *Wheelhouse.*] The colliery was much smaller when I first went there. From 100 to 150 men worked at that time. At last there were from 500 to 600 men. In Nos. 1 and 2 veins we had two shifts. Day shift from 6 a.m. to 4 p.m.; night shift from 6 p.m. to 4 a.m. Between the day and night shifts there was about one and a half hours cessation, and the like between the night and day shifts. No work on Sundays under the old system. I cannot say that the air was better at that time than recently. In the black vein a good deal of the hauling was by machinery. The Main Dukey-road is one and a half miles long. With an increased number of men working there is an increased danger of sudden outbursts. Air travels faster now in No 1 and No. 2 veins. I am of opinion that there was a sudden outburst of gas in No. 21 district when explosion occurred, and that it came into contact with some broken or defective lamp, thus causing the explosion. There is less danger after we get a large space opened. The more you work round gas, the more you drain it. I cannot tell whether it would be safer in a stall or in long work in the case of a "blower." I believe the Davy lamp is better than the Clanny, owing to the liability of the glass to get broken. A bumper is a sudden fall, and it occurs in places well timbered.

JOHN DART, sworn; Examined by the *Coroner*.

I HAVE been a collier at Abercarn for 34 years, at the hard heading. I have worked there (at the hard heading) more than 20 years.

By Mr. *Ward*.] I recollect sudden outbursts three times. I struck a blower out of the soft coal. I never was short of timber. I consider the ventilation better now than it used to be. I do not see much difference between my early days and now. The headings and roadways are now as good as formerly. I do not see any difference. I have had complaints to make.

By Mr. *Wheelhouse*.] In the old days the colliers did the repairs. I do not consider it injurious to take steam-pipes down the shaft, when the pipes are covered to prevent the steam heating the air, as was the case here.

JACOB MORGAN, sworn; Examined by the *Coroner*.

I HAVE been a collier at Abercarn for the last three months. Before that I was working at Blaenavon. I have been 42 years underground. I have worked at different places. At Abercarn I was working in No. 17 district. I worked three days in No. 21, after our places fell in John Lee's heading. I was in on the day before the explosion in No. 17. I worked in John Lee's heading. They fell in about a month before the explosion. It was a face of long work. We worked the top coal, leaving the bottom coal behind. We had plenty of timber. I cannot say that ventilation has been interfered with. I saw no gas in that district. We were coming out one night by the two doors, near Lee's heading. A boy shouted out, "Turn your lights out of your right hand into your left." There was gas working out of an old place there. We kept our lamps on the left side as we came down. We went through the doors, being let through by the regular door-boy who was stationed there. This was five or six months before the explosion. They had been clearing out that place in the night time, while we were out, and they had put some brattice in during the night.

By Mr. *Lees* (who appeared for Mr. Morgan to-day).] At that time the ventilation was good there. I worked three nights a month before the explosion in No. 21. On the Tuesday before the explosion I was working in No. 17. I was not well on Wednesday. I cannot tell you the name of the places I worked at in No. 21. The reason why I did not work in 17, was that there was no place for me to work.

THOMAS BRIMBLE, sworn; Examined by the *Coroner*.

I AM a haulier, at Abercarn pit, and have been for three or four years before the explosion.

By Mr. *Cadman*.] I worked in No. 4 district on Tuesday night, and I came up on Wednesday morning at 5 a.m. When I came out that morning I met Henry Russell at the top of the pit. I told him I had been in his place working that morning. In answer to a question, I told him the place was all on work there, and not fit for anybody to be there; nothing had fallen, but it was all on the work and the squeeze there.

By Mr. *Lees*.] There was plenty of timber there, one post and two cogs in Russell's place; there was not any room for more, as it was not worked far enough to get beyond.

By Mr. *Wheelhouse*.] I did not mention the squeeze to any one. I would not have liked to have stopped there. I left a timber-man working on the heading. It was no business of mine to say anything to anybody. I should not have told Russell if he had not asked me at the top of the pit. I saw Elijah Lewis, the fireman, tha night, but I said nothing to him about the squeeze. I worked two years as a collier in No. 17 district. As a collier I should have reported a squeeze to the overman or fireman. Lewis was at the bottom of the heading when I saw him last. Hauliers do not often report when there is a squeeze. I did not say anything to Lewis about the squeeze when I saw him on the heading. The air in Russell's stall was about the same as usual.

(Mr. *Wheelhouse* said he thought it his duty to convey to this man, and all who were concerned in matters of this kind, that when they saw any danger, even if not laid down in the rules, it was naturally their duty, under all circumstances, to make a report to some person in authority. Mr. Ward read the rnle on this point, showing that hauliers and all others are to report when they see anything wrong.)

JOHN MEREDITH, sworn; Examined by the *Coroner*.

I HAVE been a collier at Abercarn for three years in Henry Knight's heading, and for two years last before that in 17.

By Mr. *Cadman*.] I worked on the Tuesday night before the explosion, coming up at 5 a.m. Wednesday I worked in a stall on the left-hand side of Henry Knight's heading. I did not commence that stall. I have been working in it 10 weeks. I saw gas there. Joseph Guy put us to timber there. It was about five weeks before the explosion. We were ripping a piece of coal there, and putting up some 9-feet timber there. We saw some gas working out of the top. The gas was regularly there, but there were some sheets hung up in the road to carry wind up to the gas. There was not sufficient wind to carry away gas there. It knocked my lamp out as I was going in. We lagged it to 6 feet, and then it became very clear. We filled up with old timber, and cogged it as tight as we could; indeed, quite tight. It was not very warm there. One Saturday, about six or seven weeks before explosion, I went, and then I saw gas in my place, in the top. We went out and sent for the fireman. My brother

was

was working there the night before. He had gone out when I went in. My brother did not tell me anything about the gas. Tyrrel the fireman sent us all to the double parting, and we were there about an hour. It was all clear when we went back. My gob was pretty full of rubbish when the explosion happened; so it was the night before. I had sufficient timber there. I came out through the return that morning. I did not notice any cap on my lamp.

By Mr. *Lees.*] My gob was fuller at some times than at others. There was plenty of stuff to fill in with. It came from different places. There were about 25 men working there then. There was one small fall, but there was no gas there. We were putting up timber, from 9 feet to 6; we were about three months there, I think. There was gas there, more or less, during all that time. The fireman knew of it. I have not seen gas there at any other time, except the Saturday I have mentioned.

By Mr. *Ward.*] There was not any dangerous feeling about it. It seemed a "feeder." It was very bad. I felt quite safe in working there. George Harris saw gas. I never complained of the insufficiency of air there, but it was very warm. The gas came from the roof. Every proper precaution was taken to remove it. There was gas in the top. How deep I do not know. I saw no gas for three weeks before the explosion.

ALFRED GOTHER, sworn; Examined by the *Coroner.*

I HAVE been a collier at Abercarn for the last 15 years, off and on. I went down the pit the night before the explosion. I worked in a stall in No. 17. I had done so for the last three weeks. It was in the deep, in a place called "the hole." I worked in gas, from the smell of it. I went without light on account of the gas. My light was held by another man about seven yards off.

By Mr. *Cadman.*] I prevented further fall by putting up a cog and a few sticks. I never went in after that night. This was about a week before the explosion. The fall was in the face of the work, but air passed over the fall. The gas was up in the hole I can swear. It came to the place where I was putting the timber up. The fireman or overman was with me. Andrew Ashman was there with me. The fall had happened just before I went there. I do not know of any other gas there.

By Mr. *Lees.*] The gas did not choke me, but I felt rather oppressed with it. I never lost a day's work on account of gas for the last five years. There were only two of us in when the fall happened. I don't know whether they worked there during the time I was timbering. There was a fall of four stalls out of the seven that were in that heading. The wind passed over the falls. I was repairing a fall on a heading on the Tuesday night. I found no gas; men were stowing muck. I have heard that there were falls, but I never heard that the men were dissatisfied about falls. The falls were more frequent in long work than in double stall.

By Mr *Ward.*] I worked long work at Risca. I think it more frequent than in double-stall work, to find falls I mean. All proper precautions were taken to clear away gas. Pillar and stall is the safer method of working. I cannot speak to more than six months' experience of the long-wall system, but I think falls would take place more frequently in long work, even with cogs.

By Mr. *Wheelhouse.*] My reason for thinking that falls are more frequent in long work, is because of the greater weight above. In working, that would be more dangerous to a certain extent. Long work has been carried on at Abercarn for about two years. Long work yields more coal. I do no think the collier gets on faster in long work.

GEORGE SMITH, sworn; Examined by the *Coroner.*

I HAD been a collier at Abercarn for 10 years, and up to time of the explosion. I have worked in all the districts now open, except 22; last in 21.

By Mr. *Cadman.*] Tuesday night was the last time I worked before this explosion. I worked 28 on plan (George Smith's heading). I was five or six months working there. I have never seen gas. I have never tried for it. The ventilation was not good in my place. We had to come out on account of gas a fortnight before. We came out that day. On another day we were stopped to the extent of 13 places. I was making my way out from the pit when I met the overman and fireman. Joseph Guy, the overman, sent me out, and I and others were going out. He met me, however, again in Evans's place. He said, this will never do; we want coal out, and you must go and work three in a place. The fireman put a sheet up, and next day we worked there again. Mr. Pond was by the place when I was working that day. It was very warm there, almost furnace heat. Since Cwmcarn was opened, the wind has not been so good in 21 as it was before.

Mr. *Lees* asks no questions.

By Mr. *Ward.*] I did not think there was danger when I went to work.

JAMES ASHMAN, sworn; Examined by the *Coroner.*

I WAS working as a collier at Abercarn in No. 17, being so for eight or ten years, round 17 and 18 districts. I was down on Tuesday evening, and came up at 12.30 (midnight) on the Wednesday.

By Mr. *Morgan.*] I was working in the hole off Morris' level. There were no doors on that level. A sheet turned up the wind on to our heading, but there was only one sheet there, a doubled one. We had not sufficient air when that sheet was there. The sheet was displaced one day a month before the explosion for a couple

of minutes, perhaps, and then replaced. We told David Rees, the overman, who is now dead, that two doors ought to be placed there, and he said he would have them placed when we got the cross-cut finished. We finished the cross-cut about five weeks before the explosion, but the doors were not put up. There was plenty of time to put up the doors before the explosion. It was clear of gas. There was a man working to keep rubbish off from our heading. There was a fall from Augustus Thomas's heading to ours. Three places had fallen in. They were not cleared off at the explosion, but wind could get partially over the falls, though not wholly so.

By Mr. *Ward.*] I never found any gas there. Andrew Ashman was the night overman. Sometimes we saw him. Elijah Lewis was the fireman. We never mentioned it to Ashman or Lewis. I did not complain to Ashman because it was Rees who was our "gaffer." We did not complain to Ashman. The sheet was open because the trams were off the road. I came out through the sheet. There were a sheet and a crane, or two sheets and a crane on the cross-cut. We had plenty of wind going there on the morning of the explosion; there were not any signs of gas.

By the *Coroner.*] I don't know that Rees was over Ashman. I never complained to Mr. Bethell or Mr. Pond, though they were there nearly every day. I have borrowed a lamp, but never taken an open light. I never saw Ashman lend his lamp or take fire from any one.

Elijah Lewis, re-called; and further Examined.

The wind travelled between Ashman's and Anthony Lee's, but I could not travel through all the airways nor all the headings. A door would be better than a sheet. There was no work enough there.

Lewis Harris, sworn; Examined by the *Coroner.*

I was overman at the time of the explosion, and for five months before. The night before the occurrence I was down the pit. I am always the night overman, not a day-man. I was over 21 and 22 districts.

By Mr. *Cadman.*] I was a fireman before I was an overman in the same district. I was fireman for five years there. Air enters along the main Dukey-road to 21. At 17 Dukey-road it turns off; there is only a door there. This was often used during each day. If door were wide open, air would not go up 17. There was a return going off No. 17 Dukey-road back to the pit. There are three doors at the lamp station to prevent air going into the return. Horses could travel through the road to No 22 district. We laid sheets on John Taylor's heading, to turn air from going round No. 22 district. There was always sufficient wind to keep everything clear in 21 and 22. I was through these places every night. There were no falls in that face. I never knew any men come out of that face on account of gas. After Cwmcarn heading was through, we got more wind through, and along the faces. I thought it cooler. We tried to change the course of the ventilation since the Cwmcarn was opened. Mr. Pond and Terrell, Guy, Rees, James Harris, and Phillips (all dead), Bethell (also dead), tried it, but altered it back again. The reason was that the change did not seem to answer. This was five or six weeks before the explosion. The four stalls were quite filled up on the right of Knight's heading. It was sufficiently airy before, but they were trying to make it better. Once I had difficulty with gas, over 12 months back, but since Cwmcarn was opened I have had none, nor have I since seen any gas. I went round on the morning of the explosion. Everything then was in good working order. The last visit round was about five a.m. I had gone my round in 21 three times that night; there were no falls in either faces or airways that night. No trouble except on Taylor's level, and even that was very little. The gas was got rid of there.

By Mr. *Morgan.*] Before they tried the experiment there was air, but they endeavoured to improve it. I do not know how long it was on the new course, but it was traversing then. The ventilation was improved; men travelled through Bedminster's level, coming back from 21. This was in reference to the air in Aberdare's heading. There was a hole in the brickwork over, in order to keep the Bedminster level ventilated, and No 21 also. The men had to walk along there, as when the jenny was working it was not quite safe to come through the intake. This was about 12 months the case. The jenny was working for about two years before men could pass through the return safely. It was a nearer way to get out. The return was never dangerous. I never saw a cap. Yes, I have seen a small cap in No. 22 return. There were two sheets to return 22, to send wind into it through the deeps. There was a third sheet to turn wind into Solomon Jones' level. I have seen gas working out of the old workings. In No. 22 I twice saw the ranee knocked down. It was put up again and shifted into the rib so much as to make all safe there. I put a leaden weight upon it, and it remained safe till the explosion. I know No. 6, William Jones' heading. There were two sheets there cutting off the other heading, but not marked on that plan. This is the water-gauge book (*produced*). On the morning of the explosion it was three-eighths at 6 to 7 a.m. I was over-man. I do not know how many men were under me. They are on the book in the proper column there. I gave three-eighths to Moseley that morning I took the barometric measure and that of the thermometer myself that morning. I measured the wind, too, on the morning of the explosion. The return measure was in cubic feet, 23,560, on 22 return. On the airway, 16,340. Moseley was a better calculator than I was, and he put it down. At the bottom of the pit the thermometer stood at 74; at the top, 58. I never saw anybody carry a pocket thermometer. There was gas reported in Galer's place before the explosion, on the Saturday before it.

By Mr. *Ward.*] I never heard a complaint of either gas or want of timber. There was no gas lying in John Meredith's place for three or four weeks, nor ever, which was not duly cleared and done away with.

By

By Mr. *Wheelhouse.*] I have many times seen three men work in one stall. The overman would put them to work if they could not get a place to work in elsewhere. I cannot say whether Mr. Pond was aware of it. The rule is for one man and his butty to work in each stall. If three were working in one stall it would only be for a day. Mr. Pond would not allow any man to work in three places in one night. Such a thing might endanger the safety of the pit. I never knew Mr. Pond insisting on three men working in any one stall, even for a single night. About 30 trams form a train. A door would be open two or three minutes to allow the train to pass. I was down the Abercarn shaft after the explosion, but not the Cwmcarn.

Tuesday, 21st January 1879.

GEORGE HARRIS, sworn; Examined by the *Coroner.*

I WAS fireman of No. 21 district. The Tuesday night before the explosion was my last turn in the pit. I went down at 6 p.m., and I came up at 5 a.m. on day of the explosion. I had gone round all my workings, and I found everything safe.

By Mr. *Cadman.*] I was fireman for seven years in the No. 21 district. We have worked long-wall system for two years now, in that district. I have had no difficulty in that district about ventilation since long wall was begun. The air at the time of the explosion was going the same way, through the same roads as it has done ever since I was there. I was not present when they attempted to change the direction of the air. Since Cwmcarn has been opened, there is a little more wind passes. I know "New found out." After the opening was made we did not find any difficulty in the passage of the wind through these headings. I think there was no great difference in either 21 or 22 after the opening of Games's headings was through. When I left the pit on the morning of the explosion, No. 21 district was all standing and quite right. There were no falls there. I know of no gas at all there. I had been in every place that morning. I have formed no opinion as to where the explosion took place. The four stalls outside Henry Knight's heading were filled quite up to the full, but not the road itself leading off the heading for about eight yards. I was twice or three times in that place that night, and I found no trace of gas there. It is my general practice to go into each place twice or thrice.

By Mr. *Morgan* (who asks for report book, which the Witness produces).] I do not remember a propped wind-road in Taylor's level. I recollect the wind-road there. I walked through it the last night I was down, all through it; that would be on the night before the explosion. I do not reckon it to have been propped, though there was a post every here and there. I do not think there were any colliers there at all, for we were working the coal up to the white. I saw old Henry Knight cutting puckings on the bottom of the chain deep. The ventilation was quite as usual on the night before the explosion. I since saw old Henry Knight with his shirt off. I recollect Collins working in Henry Knight's heading. I saw Collins there the last night before the explosion. There were 10 or 12 working that night in Henry Knight's heading. Collins had not worked there before the last night for two months. I do not know why Collins changed his working place. His butty was William Lucas. They were closing the four stalls every night. They were filling them up. David Davies was one of those who worked at the filling up. The colliers had worked last in those four stalls about three weeks before the explosion. I saw cracks there, but I could not see through them. I saw gas there one night, about a month or five weeks before the explosion. After that I do not think they worked at all in any one of those stalls. They had ceased working on the last stall about five weeks before the explosion. I knew when John Meredith worked in Henry Knight's heading. He stood 9-feet timber in his stall, and 6-feet timber under those again. This was because I found a little gas there in a hole, when they were ripping the top coal.

By Mr. *Ward.*] I first knew of gas there about five weeks before lodging below the 9-feet collars. I cleared it at once. I did not allow it to remain. I cleared it by brattice cloth and a sheet, so as to turn the wind along the faces. The gas did not accumulate there after the clearance. I lagged it up safely and tightly between the six feet and 9 feet. If I had found gas I should have tried to get rid of it. We had plenty of timber for all the purposes of the mine. There was plenty of wind passing through 21 district on the night before the explosion. George Smith never complained to me, though I saw him twice every night when he was on the night shift, nor did Enoch White. Below Enoch White's stall there was a fall, and a little gas there after the fall, which I also cleared away directly, and in about half an hour. The fall was there when I got to the place; that, too, was mostly cleared away that night. I think the ventilation was rather better on the night before the explosion than it had been. I was travelling the wind-road all that night.

By the *Coroner.*] I never knew anyone to have a key, nor do I think a Clanny lamp can be opened without one. I have known one Clanny lamp slack. I never saw any collier try for gas with a Clanny lamp. The Dukey-road from 17 worked outright, but I never found the air baffled in No. 21. The key was kept locked up in the lamp-house. I never kept it in my pocket. Sometimes a little boy went with me down into the pit on Sunday for company.

ANDREW ASHMAN, sworn; Examined by the *Coroner*.

I AM overman at No. 17, Abercarn pit. I have been in 17 since April last. In 1873 I was at Cwmcarn shaft. I have been overman three years.

By Mr. *Cadman*.] I came out of the pit at 6 o'clock on the morning of the explosion. There was nothing wrong throughout the whole of my district (No. 17). I came out through 17, Dukey-road, to the clip. It was my duty to see trams properly hitched on. I never knew of any old roads from which gas was coming. Two months before the explosion I was in No. 21. It was then my duty to inspect that district (21) as overman. There was a small hole which they made bigger when I was there, opening it to its full width. Every collier had been ordered out except those who were making the hole, Mr. Pond, and the officials of the pit. Afterwards there was a small split made to keep Dylantrichans clear. I have been over in that district since then, but I cannot say precisely when; it was about a month before the explosion. I, Joseph Guy, Terrell, Thomas Phillips, Henry Rees, and Cartwright were trying to make some alterations. Bethell was there, but not Mr. Pond. We then took away the bashings in Dylantrichant's heading, by order of Mr. Bethell, and by his direction we afterwards replaced them. I stayed then three-quarters of an hour or an hour. I have been down the pit many times since the explosion. There are not the slightest signs of fire in No. 4, either by the intake or by the return. As we made our way up No. 4, the road seemed to get clearer, the difficulties got less as we got on.

By Mr. *Morgan*.] I tried the whole road along Lantrichant's heading many times, and never found gas there but once. I went through that place every night. A long time before the explosion there were some falls in John Lee's, which were being cleared at the time of the explosion. Seven places had fallen in on Lee's heading. Ten falls in the hole since 8th of April were not cleared. There were three falls between Augustus Thomas's and James Ashman's. I constantly travelled over falls to see if there was gas there. There never was a fall in 17 in my time that stopped up the air entirely.

By Mr. *Ward*.] There were two sheets and a crane up there. There were men grumbling about an excess of timber sometimes. The ventilation was good in No. 17. Horses went in and out of it.

By Mr. *Wheelhovse*.] I never heard any complaint from the men relative to either time when experiments were being made. Any statement of men, so far as I know, being obliged to go away during the experiments, was not true. There were 29 places working coal in my district at the time of the calamity, and four places for clearing. When the Cwmcarn heading was opened, the colliers were stopped. David Rees did not, to my knowledge, suggest wooden doors instead of sheets at the bottom of James Ashman's heading. If such a suggestion had been made, and he had thought it necessary, he would have acted upon it. I do not think air was sent in, during the experiments, to the Cwmcarn shaft.

EPHRAIM WATKINS, sworn; Examined by the *Coroner*.

I HAVE been overman for 3½ years here. Before that I was a collier. I went down on Tuesday evening (10th) at 6 p.m. I was overman in No. 2 district; there was no explosion in that quarter. I went up into No. 4 on the morning of the explosion. I went through No. 4 and examined all the working places, but I did not go through all the wind-roads. I found the district quite free from gas and danger. I saw danger marks in two places, and I went into them, not very far, perhaps 5 or 6 yards in, and it was clear so far as I went. I found Miles Moseley was not down the pit that day, therefore I went to inspect his district, because I thought it only right that the pit should not go without examination. The fireman would not do much more, no matter who was acting as overman. We have to send word to the office if we have to be absent, so as to let some official know. I saw no one taking Moseley's place that day.

By Mr. *Morgan*.] I had taken his place, perhaps, three or four times. I could do both amounts of duty, for once or twice of this kind; but not too often, or continually. I followed out Rule 4 strictly. On the night before the explosion I went into Russell's stall, and considered it safe, though it was not actually still, for there was a squeeze, but I thought that was settling.

MILES MOSELEY, sworn; Examined by the *Coroner*.

I WAS overman in No. 4 district. I occasionally worked in No. 2 and No. 17. I have been overman for about six years, and before that I was a fireman for a year and-a-half. I have worked in Abercarn for 14 years. It was on the 9th when I was last in the pit. It was at night. I went there every night. My wife was being confined. I sent my little boy to tell Mr. Bethell on the Tuesday night.

By Mr. *Morgan*.] There were five men, repairers, always with me, and bottom cutters. I went to the straight headings, except the faces of Rees' and Saunders' headings, which had fallen. The top had fallen in Saunders' heading, but I walked over the fall.

By Mr. *Ward*.] The whole of No. 4 was safe from gas and had plenty of wind, and was in all ways quite right when I left it. No complaint had been made to me. Colley's heading was both free of gas and had plenty of air, which latter was good. The faces in Rees' heading were bashed off, and all was clear of gas, and plenty of timber.

By Mr. *Wheelhouse*.] A man came to me when the explosion occurred, and I went to Risca for Mr.

Mr. Pond. He outran me and got to the pit first. I went down the shaft at one o'clock p.m., and did not come out till seven. I went to do Morley's work, as I considered it was, under the circumstances, my duty to do it. Long work is as safe as pillar and stall if the work be properly carried out. In my district the long wall has been satisfactorily carried out. A wire rope runs along the rollers in the Dukey-road. I have seen sparks fly off. I have seen sparks from a collier's wedge. I cannot say, but such sparks might ignite gas. The manager has sometimes said to me "Your district is small; I wish you would sometimes go round No. 4." A man would be very foolish if he went into a dangerous place; indeed, I should not think he would go unless he wanted to commit suicide and create an explosion.

Wednesday, 22nd January 1879.

MILES MOSELEY (child); Examined by the *Coroner*.

I DELIVERED a message from my father to Mr. Bethell. Mr. Bethell is dead in the pit. He said I will set either Ephraim Watkins or some one in his place.

No cross-examination.

Here Mr. *Pond* made his statement, and was cross-examined.

[*N.B.*—Mr. Pond's statement will be found in the Appendix to these Papers, together with my notes of his cross-examination; and, after Mr. Pond had finished,—]

Mr. *Jordan* followed in like manner, and his statement and cross-examination are also appended hereto.

Mr. JACOB HIGSON, sworn; Examined by the *Coroner*.

I AM a Civil and Mining Engineer living at Stockport. I have a certificate of service also as a colliery manager. I am the consulting engineer of Ebbw Vale Colliery Company. I was down the pit eleven days before the accident. I thought it better then than in 1873. In 1873 certain alterations and extensions were proposed to the committee of the company. I came down then and went very carefully through the place. Mr. Pond had recently become manager, and from the widening of some of the roads which was then going on, I concluded that those parts which had been altered at the date of my inspection were very much larger than their previous condition. After so examining the colliery, I met the directors often. I told them of the suggestions for improving the place that had been made by Mr. Jordan and Mr. Pond. I thought them excellent as making the place safer and better in every respect than it had been before, if well carried out. They have all been carried out, and from periodical examinations since 1873, I most unhesitatingly say that at my last visit, 11 days before the explosion, that so far as all human foresight could judge, the colliery was better and more satisfactorily worked than it had been since my first introduction to it in 1873. I have never had any reason to doubt or to make any complaint to the directors of either efficiency or management. As to Mr. Jordan, few men have had more experience alike of pillar and stall work and long-wall work; and having endorsed, up to the present moment, from my personal experience what has been done, I am bound to accept the existing condition of things in connection with this explosion. I have acceded to, and there has never been any strain put upon the management, nor interference with the detailed work of the manager, and with the circumstances surrounding him, whatever they are, for which he is not responsible; he has performed his work in a most irreproachable manner. I have tested his competency more than once, and there is no one better qualified for his office, an opinion formed from daily contact with men holding certificates. I do not know whether this pit is to be opened again or not; it certainly will not be so by the company for the next six months; I think I may say that safely.

By Mr. *Cadman*.] I was not in 21 at my last visit. It is four months since I was last in No. 21. It was then, unquestionably, better ventilated than I had ever seen it before.

By Mr. *Morgan*.] I am here one week in four, and I am often down the Abercarn pit. Any representation made to the company would, most likely, come to me; that is, if the company wished it. If propositions were laid before me, I should advise on them. Comparing this colliery with others in South Wales, I should say this gives off much gas. Much has been said about air, but nearly everything depends on the daily workings and management. I think this explosion has been caused by an uncontrollable outburst of gas. Too great a velocity of wind in a pit would cause a more early admixture of air, and might thereby become dangerous. The long-wall system is better than that of pillar and stall, and is more safe. The proposal for changing the air was laid before me, but, while I thought it was all right, I do not recollect being told why they reverted to the old plan.

GEORGE CLEMENTSON GREENWELL, sworn; Examined by the *Coroner*.

I AM an Engineer of Mines at Tynemouth.

By Mr. *Cadman*.] I have had 40 years' practice in the North of England and in South Wales. I know the long wall and pillar and stall systems, both well; I know Abercarn. In Mr. Blackwell's time I was consulted in reference to it. This is about 20 years back. I know the Black Vein seam. There is no danger in working this seam by long work. The gobs are not all filled quite as well as they can be, and afterwards they close of themselves by pressure. This filling in by pressure results in about six or eight feet from the face generally. The system of laying out and of ventilation here is generally a very good one. I have heard of the quantity of wind which has been stated as passing over, and I think it quite sufficient to ventilate the colliery. Cwmcarn pit has improved the ventilation.

Mr. *Morgan* postpones his cross-examination.

By Mr. *Ward*.] I think 74 degrees of the thermometer is low. Pressure on the water-gauge of three-eighths sectional area is ample. I have known half as much air sent up and down.

By Mr. *Morgan*.] I do not see why "bashing" should be unsafe. I think there is great advantage in adopting the long-wall system, certainly better than pillar and stall; safer also.

GEORGE WILKINSON, sworn; Examined by the *Coroner*.

I AM the Mining Engineer at Powell's Steam and Coal Company (Limited), at Duffryn Colliery. I have been in Aberdare and New Tredegar, in Monmouthshire, and in Glamorganshire, for 40 years.

By Mr. *Cadman*.] I know the North of England as well as South Wales. I have been 24 years here. I am working long work in eight or ten pits now. Working long work is one of the very safest plans. It is much easier to ventilate a long-wall mine than one on the pillar and stall system, or by double stall.

By Mr. *Morgan*.] I am a member of the South Wales Society of Mining Engineers. Probably I was present when Mr. Joseph's Paper was read.

THOMAS BENNETT, sworn; Examined by the *Coroner*.

I AM a labourer at Abercarn pit. My station was at the top of 17, by the parting on the Dukey-road. I was the signal man out to the engine-man at the parting, when the work was going on.

RICHARD DONALD BAIN, sworn; Examined by the *Coroner*.

I AM the Assistant Inspector of Mines, and Acting Inspector of this immediate neighbourhood or district. I have drawn up the following Report, which I now hand in, and am sworn to.

[Here Mr. *Bain* reads his Report (*see* Appendix).]

By Mr. *Morgan*.] I consider "bashing," as adopted in this pit, as being safe.

N.B.—*See* the rest of Mr. Bain's cross-examination at the end of his Report in the Appendix hereto.

THOMAS CADMAN (re-called), sworn; Examined by the *Coroner*.

I HAVE now to hand in the following Report, which I ask permission to read, and it is correct.

[Here Mr. *Cadman* reads his Report (*see* Appendix), and is cross-examined by Mr. *Morgan*, as will be found at the end of his Report appended hereto.]

APPENDIX.

COPIES of Sworn STATEMENTS made by Mr. *Cadman*, Mr. *Bain*, Mr. *Jordan*, and Mr. *Pond*; and Cross-examination thereon.

STATEMENT made by Mr. *Cadman*.

THOMAS CADMAN, sworn; Examined by the *Coroner*.

I AM an Inspector of Mines for the South Western District.

On the 11th September last I was at Risca, and hearing of the explosion at Abercarn proceeded immediately thither, reaching the top of the pit within an hour of the time of the accident. Accompanied by Mr. Bain, the Assistant Inspector, I went down the pit without delay, and it is not necessary for me to describe the scene of desolation and confusion which I there saw: men who were in the colliery at the time of the explosion waiting to ascend, a few dead horses lying about, with trams and broken machinery in all directions.

I heard that the manager, Mr. Pond, was then in the main return, near the bottom of the up-cast pit, and upon following him we found that within about 20 yards of that shaft the timber and sides of the road had taken fire, and were fiercely burning. Mr. Pond, with a number of men, were endeavouring to put out this fire by carrying water from near the bottom of the downcast pit. It was shortly afterwards found that at that time gas was pouring up the upcast pit in large quantities, and would fire in the fan on the surface. Upon examining the main return further back we found that it was full of heavy smoke coming from the direction of the 21 district, so thick that it was evidently impossible to proceed along that road, and that a large fire raged inside.

We then attempted to get to that fire by going through the intake, and back into the return again through a cross hole at about 300 or 400 yards from the pit; but were once more stopped by heavy falls.

Mr. Powell, of Ebbw Vale, and a few men under his charge, commenced clearing a way through, and over these falls, and in a comparatively short time we were able to reach the cross hole, but again only to be disappointed. Upon crossing at that point into the return we found it still full of smoke, proving that the fire was yet further in, and of considerable extent. We were here also unable to proceed further into the intake by reason of the heading from this cross-hole on being full of gas. The engine-house near the pit bottom was also on fire.

An attempt was also made on the west side to get into the workings up the other engine place, but there again the way was blocked by gas. After making every possible attempt to enter the workings, and being baffled and beaten back upon all sides we reluctantly ascended the shaft, between six and seven o'clock, so as to consult upon the surface as to the best course to adopt. It was then decided that another attempt should be made through the Cwmcarn shaft (two miles away) to enter the workings, and Mr. Pond and a few others went there for that purpose.

In a short time after they had left I found that the fires in Abercarn Pit had increased so much, and were burning so furiously, throwing up dense masses of black smoke through the pit, covering the whole village and creating intense heat in the shaft and on the top, that I dispatched a messenger to Cwmcarn ordering the explorers there to leave the pit as I expected another explosion every minute. From Cwmcarn, however, Mr. Pond had succeeded in getting into the workings in 17 district, and, as we have already heard in evidence, found the men all dead in their working places.

I now felt perfectly sure that every person was dead in the pit, and that, while making attempts to enter the mine with as little delay as possible, it would not be right to allow many willing hands to rush into what then appeared almost certain destruction.

If there had been any chance of a man or a boy being alive in the pit, no attempt would have been spared to rescue him. After a consultation and careful thought, it was decided to flood a portion of the mine as the only safe means of extinguishing the fires, and this was commenced the next morning by letting in water from the canal.

It took several days to pour in sufficient water, and of course much more time to wind it out again; but since that time the roads have been cleared in towards the Nos. 4 and 17 districts on the west side for about 500 yards, and on the east not quite so far. From time to time, while these clearings have progressed, I have visited the mine, and carefully noted all indications which would assist me in forming an opinion as to where the explosion originated, and I will at once say that it is perfectly clear to my mind that the seat of the disaster lay in 21 district. The further the headings were cleared towards No. 4 the less the effects of the explosion appeared to be, and indeed the actual fire does not seem to have extended to that side at all. Nevertheless, from the evidence given,

the poor men in 17 district were badly burnt, yet everything points to the 21 district as being the centre-point from which all blasts blew.

Of course, the unfortunate matter of closing the pit, and stopping all operations with regard to re-opening the workings, does away with the possibility of examining the place where I have no doubt the explosion originated, so as to ascertain if any evidences exist there which may throw light upon the cause of this dreadful calamity, so that we must go back to the state of the colliery before the explosion, and endeavour from that to draw any conclusions as to the reason why it occurred. I have been into this mine on many occasions, and three or four times during the past year. The last time I examined the 21 district was in the spring of the year, when I failed to find any gas. The long wall system had then been adopted, and I believe the longest face in the colliery was in that district. I was anxious to see how it could be worked in the Black Vein, and it is my duty to state that I was pleased to find the 'gobs all fairly stowed, and carried up with the face; and talking over the matter with Mr. Pond I explained to him my opinion that his great object should be to keep the wasters filled, and that if he could do this, the change would be beneficial. For many years a system of double stalls had been carried on, and where there was not sufficient rubbish to fill these up when abandoned, the entrances merely were closed by filling 10 to 20 yards with spoil, and the interior left open. I may at once say that I do not believe in the possibility of perfectly shutting in gas in this way, and if by the change in the manner of working the coal the goafs could be better filled, it would be safer. I do not think the change from pillar and stall to long work caused the explosion, but that some other reason must be assigned. It has not been shown I think in evidence that any vacancies were left in 21 district in the long work, but as far as I have gleaned all were fairly filled.

There appears, however, to have been a desire on the part of the management to change the courses of the wind in that district, and it has been stated by some witnesses that since the Cwmcarn Pit was connected with the workings, the ventilation was not so good in the faces there, although this was contradicted by others. If we examine the ventilation of that district as shown on the plan, it is evident that the arrangement is such, that if proper attention was not constantly paid to the matter, and some doors left open, the main portion or some portion of the district must be left unventilated, and would in a very short time become heavily charged with gas. It is the furthest district from the pits, and the most difficult to ventilate. I cannot help thinking that there some derangement of the ventilation occurred, allowing gas to accumulate in a portion of 21 district, which was fired by one of the lamps in use. I have never detected a defective lamp in the colliery, and the discipline in the mine has always appeared good. When the Cwmcarn Pit was completed, the quantity of wind passing into the workings was certainly much increased, and the chances of preventing an explosion with a proper distribution of the air lessened very much; so that as I knew the Black Vein to be one of the most fiery veins in the country, I felt a great relief. I recollect upon one occasion, while examining the mine, finding the returns not to my mind satisfactory, especially on the 17 and 4 side, and drawing Mr. Pond's attention to the matter, he at once gave instructions to have the men removed from that district until the matter had been rectified. This was before the Cwmcarn headings were completed. A considerable quantity of gas was given off in those headings, while they were being driven up through the solid coal towards the pit, and as the air passing through them had afterwards to travel into the 17 district, I recommended the workings on that side to be suspended until the new openings were complete, and I afterwards ascertained that this was done. Upon a later occasion I happened to go underground in the mine after the Cwmcarn headings were finished, and I found in No. 4 district a squeeze or crush had come upon the workings, and a considerable quantity of gas was given off, but the men had been all taken out, and simply the officers and repairers allowed to remain in to restore the safety of the district. I was in the pit on the 12th August, when I found the returns remarkably clear from any indication of gas. I have often recommended the manager to have the 30th General Rule carried out, but the men appeared to object. The men, however, examined the workings in July last, and reported as we have seen. I think after the gas had become ignited in the 21 district, that the fire was carried over the other portions of the colliery by the dust on the roads, and any other gas which might have been found in the old workings. I am of opinion that the dust has often a great deal to do with the extent and damage done by heavy explosions.

Mr. *Cadman* (in reply to Mr. *Morgan*).

Loose sheets are sometimes better, sometimes worse. Two doors would be more effectual than a door and a sheet. You cannot lay down any special or general rule. I like stone bridges better than wooden ones, but these were very good. I cannot say whether there was more than one explosion. I should much like to have got to the air-bridge. I cannot tell how long it would take to get there, but not long, I think; perhaps a fortnight might suffice.

STATEMENT made by Mr. *Bain.*

RICHARD DONALD BAIN, sworn; Examined by the *Coroner.*

23 January 1879.

I AM an Inspector of Mines, residing at Newport, Monmouthshire, and acting as assistant to Mr. Thos. Cadman.

I was appointed to this district in August 1877, and from that time to the day of the explosion, I made several inspections in the Abercarn colliery.

The coal worked is known as the Black Vein in this district, and is the same as that wrought at the adjoining pit, Celynen, and at the Risca colliery. It is from 9 to 10 feet thick, and gives off a considerable quantity of fire-damp.

The system adopted until recently is what is known as "double stalls," or two roads driven in open to one another in one face of 14 or 16 yards wide, and a strong pillar of coal would be left between them and the next pair of roads. These roads would be carried in some 60 or 80 yards, and afterwards abandoned, the empty space not being in all cases packed or filled up, but simply about 20 yards at the entrance to each road bashed or stowed up.

The mine was divided into four or five different districts, at considerable distances apart, and was ventilated by separate splits of air, the coal being brought to the pit bottom by means of long engine planes, worked by engines placed near the bottom of the winding shaft.

The ventilation was latterly effected by means of a 40 feet Guibal's fan at the top of the upcast shaft, but formerly there appears to have been a large furnace at the bottom.

When I first visited the colliery, I found from measurements about 72,000 cubic feet of air per minute coming back through the returns from the workings. At that time there were only two pits connected with the workings, the winding, or Prince of Wales' pit, and the upcast; but a third shaft, 20 feet diameter, had been sunk to the coal, at a depth of about 250 yards, and headings were being driven to connect it with the underground roads for the sole purpose of increasing the ventilation. The mine, then, at the far end was warm, but I never found any dangerous accumulation of gas, and the management appeared to me careful, and discipline fairly maintained.

During the time required for driving these headings through the solid coal towards the Cwmcarn shaft, a large quantity of gas was continually given off, and Mr. Cadman suggested that the working in No. 17 district should be suspended till after the communication was made, to save the necessity of men working near gas.

This suggestion, I believe, Mr. Pond carried out, and that district was stopped until the roads were finished, and fresh wind brought into it from Cwmcarn pit.

I have always found Mr. Pond very willing to adopt any plan for increasing the safety of the colliery, and in all the examinations I have made of the pit, with the exception of the Cwmcarn headings and a cap on the lamp on one occasion in the No. 4 return, I have not found any gas.

Some of the witnesses have spoken of the airways being of inadequate size, but I think it only right to state that I have several times been through all the main returns in the pit, and I always found them of sufficient area for purposes of ventilation.

About two years ago the long wall system of working was introduced, and is employed at the present time. The matter which, I believe, was generally considered the most dangerous, and which, though carried on for many years, appeared the most objectionable, was the bashing or shutting up the gas in old stalls, although there being a current of air passing outside the bashing, everything was apparently safe.

I understand that the change to long work would much reduce the open spaces where gas could accumulate in the goafs or old workings, and would bring the working faces into a more compact and limited area, and with the increased ventilation when the third shaft was connected would materially add to the safety of the colliery.

The headings from the Cwmcarn pit were first connected with the old working in April last, and on measuring the air a few days after, I found a considerable improvement in the ventilation, the quantity having immediately increased up to 113,000 cubic feet per minute, and soon after that when the communications were perfected, there would be a still further addition to the ventilating current.

On the morning of 11th September, I was at Risca with Mr. Cadman and Mr. Pond, who had been arranging about some alterations to the special rules, had left us a few minutes, when word was brought that an explosion had occurred in the Abercarn pit. We at once came to the place, and went down the pit immediately.

The bottom of the shaft, especially on the 21 side, was considerably blown about by the explosion, and the coal and timber in the return near the upcast were on fire. After this fire had been nearly extinguished, I went with Mr. Pond and a few others to explore the workings as far as possible, but, with the exception of No. 2 district, from which the men had escaped, we were unable to penetrate more than 200 or 300 yards, owing to the gas and afterdamp that were met with.

I have been down the pit from time to time since the explosion, and watched the operation of opening out the roads, and from the strong indications of fire on the coal and timber for a considerable distance on the 21 side, and the entire absence of any indications of fire, or a blast, on the other side of the pit, I think there can be no doubt that the explosion originated in that district. The weight of the evidence given at this inquiry also leads to the same conclusion.

From want of definite information on the subject, coupled with the inability to make an examination of the interior of the workings after the accident occurred, it is impossible to determine with certainty the origin of the explosion.

The responsible officers of the colliery all speak to the workings being safe, and free from any accumulations of gas the morning of 11th September, a few hours only before the calamity occurred; we must, therefore, look for some other explanation of the presence of the large body of gas which undoubtedly became ignited.

Gas may have come off suddenly in the form of a blower, or been liberated by a fall of coal, or roof, or possibly these two events may have occurred simultaneously, and a lamp damaged by the fall, the high velocity of the escaping gas, or an unseen defect in a safety lamp, may have caused the flame to pass through the gauze and communicate with the body of gas already in an explosive mixture.

The Abercarn pit is very dusty, and this, in the event of an explosion, would no doubt very considerably add to the power and extent of it, and would have the effect of carrying the blast further, and with much greater force than would be the case in a less dusty mine.

(signed) *Richard Donald Bain.*

Cross-examination of Mr. *Bain.*

By Mr. *Morgan.*] I consider bashing adopted in this pit partially safe. The more you fill up empty spaces the safer it would be. I consider 10 or 12 feet of bashing pretty safe. I should not in all cases want to have a longer bashing than 10 or 12 yards, which would be sufficient for a work like this. I think the ventilation of this pit was sufficient. I do not remember observing any falls, but I have not been there since April, and then I did not visit the work places. In March, one day when I was there, I did see a "cap." I was only in 4 and 2, and I came out through No. 21 return.

STATEMENT made by Mr. *Jordan.*

ROBERT JORDAN, sworn; Examined by the *Coroner.*

11 September 1878.

AT the time of the explosion I was in London. About 5 o'clock in the afternoon of that day I received a telegram from Mr. Rowbotham, saying that an explosion had occurred at Abercarn, and requesting me to return there at once. I took the first next train, leaving Paddington about 8.20 p.m., and arrived at Abercarn Colliery about 3.30 a.m. on the 12th, and found there the following gentlemen, viz.:—

Mr. Cadman, Her Majesty's Inspector of Mines for this district.
Mr. Bain, Her Majesty's Assistant - ditto - ditto.
Mr. Kelly, General Manager, Risca Collieries.
Mr. J. T. Green, Colliery Manager, Newport Abercarn Collieries.
Mr. Edwin James - ditto - - Risca Collieries.
Mr. John Jones - - ditto - - South Wales.
Mr. S. Birrell - - ditto - - Ebbw Vale Company, Pontypool.
Mr. James Powell - ditto - - Ebbw Vale Company, Ebbw Vale.
Mr. W. James, Mechanical Engineer, Risca Collieries.
Mr. W. P. James, Colliery Manager, Ebbw Vale Company, Abersychan.
Mr. R. C. Strelley, Mining Engineer, Ebbw Vale Company, Ebbw Vale.
Mr. J. Partick - - - ditto - - Bassaleg.

Also numerous officials of the Ebbw Vale Company, and many other gentlemen who had kindly come forward to render assistance.

My first inquiries were, as to who were saved, and who were not; then, as to the ventilating fan; thinking, and not then knowing the extent of the disaster, that if the fan was all right we might soon re-enter the workings.

I was informed that the colliery was on fire. There was at that time an immense dense volume of smoke issuing with great velocity from the upcast shaft, and I found that the water from the Monmouthshire Canal had been turned into the pit. Mr. Cadman and Mr. Pond informed me that they and others had been down the Abercarn shaft, and had explored the workings in all directions so far as they could get, but could not go very far, being stopped by foul air, gas, or falls; that in the "return" from No. 21 district, at the new cross cut, about 400 yards from the shaft, there was dense smoke coming out along the "return" from the inside, indicating the existence of strong fire; this prevented further

further progress in that direction, and they could not get it along the "intake," beyond the cross-cut, as it was full of explosive gas, and there was the great danger of the slightest disturbance of the air forcing this gas on to the fire, and so destroying the lives of all the explorers then in the pit. They then came out, and Mr. Pond and others went to Cwm Carn shaft, and entered the workings there, where, after penetrating for some distance they were stopped, in every place they tried, by falls. While there a sudden outburst of smoke from the up-cast at Abercarne, caused Mr. Cadman to think that another explosion had happened; he therefore sent men down Cwm Carn pit to fetch Mr. Pond and the others out, which they did.

After receiving the foregoing information, and knowing therefrom that the pit was full of explosive gas, and that the colliery was on fire, of which there was abundant proof at the top of the up-cast, but to what extent internally no one could tell, I knew it was not safe for anyone to again enter the mine until the fire was put out, and that the surest and quickest way of putting it out, was to allow the water from the canal to continue to run in until the pit was flooded. I therefore allowed it to continue; and this was afterwards approved of by the Company's Consulting Mining Engineer, Mr. Jacob Higson, and by the conference of the leading mining engineers of the district, which was afterwards held. The last time I was down the pit prior to the accident was on the 9th August 1878. Mr. Pond was from home, and I went with Edwin Bethell, the head overman, through all the returns in the pit, commencing at the bottom of the up-cast, going into No. 21 district, thence to the return of No. 17 district, through that to the return of No. 4 district back to the up-cast; thence through the stables to the "return" of No. 2 district, and out along the No. 2 Dukey road to the bottom of the down-cast.

I carefully examined the air in all the returns, but could find no trace of gas, and was highly satisfied with the quantity and the quality of it. Not long before that I had been with Mr. Pond all through all the working faces of No. 21 district, and found a strong current of wind all through. In a hole in the roof just over the front wall of the gob, in one of the faces there was a little gas which was coming off from a small feeder; Mr. Pond and myself, and Joseph Gay, the overman of that district, examined it; that was the only gas to be found on that day.

On our way out Mr. Pond and I opened the door on the No. 17 Dukey-road, near the No. 21 Dukey-road to see what air would pass that way with the door open, and found that none did, except an almost imperceptible quantity, which was not more than sufficient to keep it clear.

The reason why the air going into No. 21 district did not turn short into No. 17 Dukey-road, when the door was open, was because the air from No. 17 district and from No. 4 district filled the "return" from those districts, so that there was no room for any more, and also because the "return" from No. 21 district was large, and had only the air of that district to deal with.

A short time before the visit here spoken of I had been to the other districts of the pit, and found them clear of gas and well ventilated. Reverting to the No. 17 Dukey-road, the air not going that way when the door was opened, was what we had expected, and proved, before the occasion I have mentioned; and the reason for fixing that door at all was because it was found that when the journey of trams was coming out of No. 21 district it forced some of the air into No. 17 Dukey-road, therefore the door was put up to prevent it.

In February 1873 I first became connected with the colliery. At that time the No. 4 and 5 coals, commonly called No. 3, were on fire near the up-cast and down-cast shafts. The extinguishing of this fire, which had previously been commenced, had to be, and was completed. After this the up-cast shaft through previous dilapidation gave considerable trouble, which made it unsafe, through the falling in of the sides, for any person to go up or down it; and in order to keep the colliery going, and at the same time comply with the Act of Parliament, we sought and obtained from the Home Secretary permission to do the necessary repairs without stopping the colliery. The whole was safely accomplished within a stipulated time (six months).

Besides the afore-named difficulties, the ventilation was not considered satisfactory by ourselves, as it frequently happened that in boisterous weather, or a southerly wind, the air in one or other of the districts would become so foul, showing a large cap on the lamps, that the men had to be withdrawn until the air had cleared. In consequence, a report upon it was laid before the directors of the Ebbw Vale Company, and a proposal made for the sinking of the Cwm Carn shaft, which was acceded to, and ultimately carried out. The workings now mentioned where the explosion occurred were in the No. 6, or Black Vein Seam.

In February 1873 the air passing through all the workings of this seam was 66,000 cubic feet per minute, exclusive of what went through the stables and the No. 3 workings. The lamps sent down the pit every morning, which corresponds with the number of persons employed, was about 380, which gives nearly 174 cubic feet of air per lamp (or persons) per minute. Taking the 6th September 1878 for comparison, we have recorded in the ventilation book 136,000 cubic feet of air passing through the workings, which was exclusive of stable and other air; and it is also recorded elsewhere that the number of lamps sent down the pit on that morning was 390. These figures give us 348 cubic feet of air per lamp (or person) per minute, and reference to the records will show that they are about the usual daily number of lamps and quantity of air. In both computations (February 1873 and 6th September 1878) the number of horses in the pit is not taken

into account, but I may state that the number employed in the pit in February 1873 was 70, and in September 1878 it was 57.

The seam of coal is 9 to 10 feet thick.

It has always given off constantly a large quantity of gas. After the explosion, when the Abercarne shafts were sealed by a depth, at one time, of 50 feet of water, the quantity of gas issuing at the top of Cwm Carn shaft averaged nearly 600 cubic feet per minute, and it was on one occasion as high as 1,764 cubic feet per minute.

In working the coal only about six feet of the seam was got; about 2½ feet of the upper part of it was left up to support the roof, above which is a somewhat brittle shale. The system in use from the commencement until about 12 months before the explosion was the "pillar and stall." The stalls were double, *i.e.*, had two roadways into a face of 14 to 16 yards in width, with pillars of 6 to 8 yards left between each pair of double stalls. The gob between the two roadways was partially filled with what little rubbish the mine produced, by the repairing of the travelling roads, airways, &c. As a rule, the stalls were driven in about 60 yards, then stopped, and the mouths of them "bashed" up for about 10 yards in with rubbish to prevent the escape of any gas that might accumulate therein.

The pillars were generally (until recent years) left unworked. It will thus be seen that each double stall would, when finished, be a closed cell, with coal forming its sides, one end, roof and floor, 60 yards long, 14 to 16 yards wide, 6 feet high; filled, partially only, with rubbish in the gob between the two roadways, and it would thus form a reservoir for any gas that the surrounding coal might give off.

The system first described was carried out from the commencement of the working on the Black Vein Seam up to about 12 months prior to the explosion, as before stated. Then, after mature consideration, it was resolved to adopt the "long-wall" method, and the following are some of the reasons for so doing, viz.: the air necessary to ventilate each working-place must travel four to five times as far in double stalls as it would, for the same quantity of coal, have to travel in the "long-work" stalls.

And to produce an equal quantity of coal the "long-wall" method would require two-thirds only of the area of work open (or pit room) that the double-stall method would require; therefore there would be but two-thirds of the area to ventilate. The headings also would be proportionately shorter, and consequently more easily kept in repair for the passage of air, &c. The getting of coal by "long wall" is no new thing to the Ebbw Vale Company, for at many of their collieries it has been in use for many years in thin and thick seams, and its advantages fully proved. Much has been said during this inquiry relative to the stowing of the gobs in "double stall" and in "long work," and one might have inferred that it was the invariable rule in coal getting to stow every vacant space full of rubbish for the express purpose of preventing their becoming receptacles for gas, but such is not the case, and nowhere is it done for that express purpose, and the difficulty of procuring rubbish enough to do so in a thick seam, like the Black Vein, worked by pillar and stall, must be obvious to all.

It is much more easy to obtain rubbish enough for that purpose by the "long-wall" method, as after it has been thoroughly opened, and the whole weight of the overlying strata comes upon the gobs or packs, the latter become compressed in time to about one-third of their original height, consequently to maintain the necessary height in the roadways of the mine, a considerable thickness of the strata overlying the coal has to be taken down in the roadways, and is available for stowing the gobs and disused roadways of the advancing face. In working coal by "long wall" in this district, every effort has always been made to fill up closely the entire gob between the roads for the purpose of better supporting the roof, and of so avoiding the trouble and hindrance arising from falls. The usual distance between the roads, or in other words the width of the pack, would be 8 to 10 yards, as a rule, closely filled with rubbish. But in other districts something like the following practices prevail: the roadways are about 20 yards apart; on each side of them a pack of three yards is built; the intervening space of 14 yards is left empty, and the roof across that portion of the working face is supported by two rows of timber cogs, the one behind the other. As the coal is worked off at the face, a third row of cogs is built as near as practicable to the face, and the hindermost row of cogs is knocked out for the purpose of getting the roof to fall between the packs, in order to take the weight of the roof off the coal face, to prevent the coal from being crushed; and the stone for building the roadside packs is procured from what has fallen in the "waste" between the packs.

The frequent appearance of gas in holes in the roof of the workings of the Abercarne Colliery is only a natural consequence of the large quantity of gas that was continually coming off from the coal, and which flowed away, intermingled with the ventilating air current; but which, when it met with a hole in the roof, would settle in such hole, as water would settle in a hole in the floor. Or it might be that in such hole in the roof there would be a small feeder of gas, either from the coal left up to support the roof, or from the strata above the coal.

But it was the constant rule to search for, and take steps to remove, such accumulation of gas as soon as discovered.

With regard to the cause of the explosion, my opinion is that it did not occur through any tampering with the safety-lamp by any one of the workmen, nor from any carelessness on the part of the workmen; for, taken as a whole, I do not think a more careful body of men ever went into a pit; but my belief is that a large and sudden outburst of gas,

beyond

beyond human control, took place; that it came upon the lamps in such quantity as to make the gauge hot enough to permit the flame to pass; or that, in the sudden fright, someone rushed with such speed through the explosive mixture as to force the flame through the gauge; or that, notwithstanding the care with which the lamps were examined, there might have been a defective lamp, either of which would cause the explosion. Or it might have been that, simultaneously with the outburst of gas, a fall of the roof may have taken place, and have come upon a lamp, or lamps, and damaged it or them, and so have fired the gas.

(signed) *Robert Jordan.*

Cross-examination of Mr. *Jordan.*

By Mr. *Cadman.*] I believe the explosion originated in No. 21 district. I have been down since the explosion many times. I have been 400 or 500 yards up No. 4 since then; that is, as far as they have cleared, or nearly. There were no signs of fire or blast under crossing from 2 side of No. 4 Dukey-road, on the stable side to the up-cast; this latter was blown up. Water was more likely to have caused the falls than the explosion. I saw strong evidences of fire for a long way in on the 21 side of the pit. In 21 district I found a great improvement in the ventilation after Cwmcarn was opened. It was much cooler, and more free from "cap." There was no difficulty when Cwmcarn Pit was opened; that was previously arranged for. I thought it was quite sufficiently ventilated. Since the introduction of the long-wall system, the places where gas can accumulate are much fewer, and the colliery, therefore, is much safer.

By Mr. *Morgan.*] I cannot tell how the air was distributed in 1873. I do not consider the works more extensive than formerly, though the advances have been greater, from the distances being worked further from the pit's mouth. 50,000 feet of air per minute was sent down the Cwmcarn Pit. The supply of air was less in proportion to the number of men employed in No. 21 district, but not less absolutely. The air-bridges had stone sides and timber bridgings.

STATEMENT made by Mr. *Pond.*

CHRISTOPHER POND, sworn; Examined by the *Coroner.*

I WAS appointed Resident Manager of Abercarn Colliery in February 1873, at which time there were two shafts, a winding and down-cast shaft of oval shape, 18 by 22 feet diameter, depth 298 yards.

An up-cast, also, oval shape, 17 feet 6 inches by 10 feet 6 inches, depth 298 yards.

The colliery was ventilated, and is now, by a Guibal fan, which was erected about 1870, of the following dimensions: 40 feet diameter, width of vanes 12 feet, worked by a 36-inch horizontal engine, and 36-inch stroke, with a duplicate engine the same size; fan was then working 60 revolutions per minute.

The coal worked was then, and before the explosion, solely the No. 6, or Black Vein Steam Coal, which is usually 10 feet thick, giving off a large quantity of gas; the roof nearly always a brittle shale, sometimes with a thin clod immediately over coal, which top in all narrow roads always broke up, and sometimes to a considerable height, the roof over coal being so bad, about 2 feet 6 inches of the top coal was left up as a roof in both headings and stalls, or, as it was usually termed, working under the splittings, and working about 6 feet of coal; there has always been on that account a scarcity of rubbish to fill up the gob between the double stalls, the usual practice being to gob about three to four yards from the roadside, leaving the middle of gob only partially filled up.

The colliery was at that time worked on the double stall system, the stalls being turned off narrow headings 9 feet wide, 6 feet high, and 15 to 16 yards apart, the stalls turned 11 yards apart, with a pillar of coal 8 yards wide between each pair of stalls. The stalls were driven in 4 to 7 yards narrow, 9 feet wide, and then opened out to a distance of 60 yards from the heading, when the plates were taken up and the stalls bashed at the mouth for eight or ten yards. In driving on the narrow headings it is usual to stand double timber made of 6 feet 6 inch sticks, and fixed about 4 feet apart; in a short time the top coal would break and the timber had to be doubled; the roads would also puck and give no end of trouble. For some time I made no alteration whatever in the manner of work except to enlarge the main return, which had previously been commenced by my predecessor; I had, however, often thought that it would be a great improvement, if instead of working continually in the solid we could work out the pillars, knowing that we should be getting a large quantity of coal, about 20 per cent., from which the gas had been drained, and thus improve the state of the air in the colliery; we should also be assisting the old roads, after being finished, to close up tighter, and in a shorter period.

Nine months after taking charge I commenced, and for a long time successfully worked back the pillars, having very great trouble with repairs to the headings and main roads.

I also, about July 1873, commenced to drive the headings wide; that is, working all coal out between the two headings, and also with a gob of from 6 to 8 yards on each side, not for the purpose, as stated by a witness, Thomas Rees, for saving the cost of opening stalls, but purely for making a better road, which could be always ventilated right to the face, instead of having a brattice, sometimes of 40 yards, which was always giving us very great trouble to keep clear of gas.

Not having sufficient rubbish in the colliery, we were unable, when the stalls were finished, to fill them up from the face to the parting, and there was no other means to adopt than to bash them up at the mouth.

I may here state that this is not an unusual course to adopt in all colliery districts.

There were many objections to the working of the coal on the double-stall system; in the first place, the air having to course in and out the stalls, checked at all turns, very much retarded the ventilation. We were also frequently troubled with the faces of the stalls falling; in some cases, we have had stalls fall in twice before they were in their distance, when gas was often given off, and, on some occasions, filled nearly out to the heading, which could not be cleared until a wind-road had been driven from a stall above or below.

It had for some time been thought desirable to work the coal on the long-wall system, and the question was many a time discussed between Mr. Higson, Mr. Jordan, and myself, and after most carefully weighing the matter in all its bearings, it was, about the end of 1873, arranged to commence, and had, for some time before the explosion, had all the colliery working thus, and can myself say, I have been most favourably impressed with it, having a splendid face of 25 roads in 21 district, which had not given us any trouble. I have also had it working in the No. 2 district, where we have the worse top in the colliery, and where it answered most satisfactorily. It is, of course, fully anticipated, that in opening out long-walk, at first, that we should have most of the places fall in, but that after it had been opened in a long face, and the places getting settled, we may then not expect further serious trouble, and which we have found to be the case.

I may here state that the directors of the Ebbw Vale Company have at all times been anxious to make the state of the colliery as safe as it could possibly be made, and were prepared at all times to expend any amount necessary to attain that object, as on my mentioning the necessity of getting out the fire in No. 3 coal, I was instructed to push it on with every energy, and on my mentioning to them the state of the up-cast shaft, I was instructed that same day to use any means and men to secure and wall all insecured and unwalled parts of the shaft with 12-inch bricking, that work alone costing several thousand pounds.

The fan has almost been completely renewed about three years back. A fine shaft of 20 feet diameter, 250 yards deep, has been sunk at Cwmcarn, two miles from the present old shafts, purely to improve the ventilation of the colliery.

On the 11th of September I had gone to Risca to meet Mr. Cadman, Her Majesty's inspector of mines, in reference to an alteration of the rules. I had but a short time parted with him and Mr. Bain, when I met a gentleman who was coming to look for me, and who informed me that something serious had happened at Abercarn. I requested him to follow after Mr. Cadman and inform him; made all haste to the colliery, on my way meeting E. Watkins, night overman, who was looking for me, and who informed me that an explosion had occurred at the pit. I arrived at the colliery at half-past one; on my arrival at the top of the pit, I found the cage about to arrive at the top, for the first time, bringing some men from the bottom. I immediately descended, accompanied by Lewis Harris, M. Mosely, Wm. Symons, T. Herbert, and others; on getting near the bottom I got by ladder to the level, when I met a large number of men and boys who had fortunately got out safely out of the Hard Heading, or No. 2 district. I addressed a few words to calm them, and requested them to allow all boys to ascend first, when the men immediately retired, and pushed a number of boys to the front. Leaving Wm. Symons in charge of pit, I went first to the east side, when I met John Harris and Charles Preene preparing to erect sheets on the cross-cut to restore ventilation. I passed through cross-cut into return, and on looking back, saw a strong fire burning near the up-cast shaft. I at once ran back, placed Charles Preene at entrance of cross-cut, to see that no one attempted to erect any door or sheet, and informed him of fire, then went to the west side and placed Mr. Wm. James, of Risca, at the entrance of cross-cut, and informed him of fire. I sent up by Wm. Symons for more buckets and men, and went on into west side, to see doors between up-cast and No. 4, Dukey-road; found a heavy fall at door nearest No. 4 Dukey-road, completely blocking that place up. Knowing that after the explosion a large body of gas would be all over the colliery, I saw that every energy must be exerted to put fire out before any step could be taken to restore ventilation. In No. 4 I found John Evans and Charles Baker sitting down, waiting for some one to call for them, so they told me. I placed a man, Thomas Rees, No. 2 side, to prevent strangers straying that way; he, however, shortly left, and I had to place another man there; sent to Cwmcarn to inform them of fire, and ordered that no sheets were to be put up, and remained myself at the fire to direct operations, where I shortly joined Mr. Green, Mr. James, Mr. Cadman, and Mr. Bain, but having to carry water a long distance from the west side of pit, not having sufficient men, I went up pit to collect some, when Lewis Harris informed me the gas was strong in the fan; ordered him to remain there, and with men again descended, and with a large body of willing men working hard, and with the assistance of a gentleman present, we soon gained on the fire. I was now informed there was a black smoke coming back on return; examined it, and sent M. Moseley around to Flue stable,

to

to see from what direction it was coming, who shortly returned, being unable to get beyond flue. I then ordered him to try and get up to No. 4, and accompanied by Mr. Green, started into East Dukey-road, where there were several small falls, and one completely blocking up way; leaving Mr. Powell with some men to clear fall, then went up No. 4, but found that I could not get but a short way above Arch stable, the road being full of gas: then returned back on to East Dukey-road; the fall had been cleared, andwe were enabled to get through cross-cut into return.

Mr. Cadman and Mr. Bain being with us we found the intake Dukey-road full of fire-damp close to cross-cut, and a thick dark smoke coming back return, showing evident signs of a fire being somewhere in the return; we now returned to the surface, leaving a few below to watch return and repair bottom of shaft, and held a short consultation at the office as to further operations, when Mr. Cadman, Mr. Bain, Mr. Kelly, Mr. Birrell, Mr. Partick, Mr. James Abersychan, Mr. James Risca, Mr. Powell, and myself were present; when it was suggested that an examination of the Cwmcarn workings should be made before anything further was done at the lower pits, and thinking it would be necessary, should there be the least chance of anyone being alive, to clear some falls or ventilate any part, it was thought desirable to remove all men from the lower pits, and, accompanied by Mr. W. P. James, I then went to Cwmcarn Pit, ordered men to follow with tools, and immediately descended with some four or five men, following down No. 2 heading into Michael's heading, and into Israel Lewis's stall, where he was found in the far end of his place, and evidently had not moved from where he was working; then passed to bottom of heading, where we found three bodies; then went up straight heading over two falls, and to a large fall which filled the road; then down heading, passing Lee's heading, to a fall filling the heading about 80 yards below Lee's heading; then up Lee's heading into John Matthews' road, where we found five bodies, which we brought out in the heading, placed on the side. Being joined by Mr. Jones Abertillery and Mr. Strelly, we now made our way down John Roberts's heading over a number of small falls which occurred every 10 or 15 yards, nearly all the way down, showing that there had been a strong blast, and which appeared to me to have passed up towards Cwmcarn Pit. We found a close fall on 18 level, also a close fall back towards 17 Dukey-road, and, finding we could not go any way, we returned to the top of the deeps, when I met Henry Davies, John Fletcher, and John Marsh, who came from Mr. Cadman to order us out. Hastened to lower colliery where I found a large column of smoke coming up up-cast, showing that a most extensive fire was raging down below. After a consultation it was the unanimous opinion, knowing that the colliery was full of gas, and that it was impossible for anyone to be then alive in the pit, that the water should be turned from the canal into the colliery, though sadly against our inclination, about 2.30 a.m. Mr. Jordan arrived about 4 a.m. and took charge of operations. The water was allowed to run into colliery until midday on the Monday.

On Thursday, the 12th, a meeting of some of the principal mining engineers of the district was held, who all agreed as to the advisability of turning the water into the shaft.

On Thursday, the 19th, another meeting of the engineers was held, when it was thought advisable to commence pumping operations, and from that time every energy was exerted in clearing out the shaft and workings. I will now endeavour to explain a few statements given in evidence as to state of colliery. First, as to squeeze in Colley's-road on the Saturday. Had heard, at pit bottom, 10 a.m., of the weight in stalls; went up, examined places; removed men from faces; sent William Walters inside to clear men out, not that I anticipated danger, but as a precaution; found gas in a hole in Thomas Rees' heading, and also in stall on right, with a little working back along faces for about 10 yards, the top coal having fallen; got about 10 men back, put them to cog and prop places, and in 5 or 10 minutes had as much timber as these men could put up, so that we could'nt be short of timber, as stated by Thomas Rees; about 12 o'clock left E. Bethel in charge, and gave instructions what to do.

It has been stated that No. 4 district was stopped for a week on account of gas, and I feel very pleased to state the same, and that it was solely because there was but a small quantity of gas working out of two bashings, which no one could possibly help.

As to gas mentioned by John Adams, in 21 district, I was informed of it by Lewis Harris that there was a little gas one night, but that he had cleared it; I gave orders at once to stop all the four stalls.

Gas reported by George Smith in 21. I was told of it by Joseph Gay one night; went in next morning, inspected the places all round several times, had men all cleared out, and made arrangements to improve ventilation there.

As to size of air-ways in No. 4 being stated as not so large as six years ago, I can simply state that about three-fifths of the wind-roads there have been made since the last six years; also that Henry Russell, according to our machine books, filled, about the 7th of September, trams of coal weighing 24 and 25 cwt.; also that it was necessary to check the air in No. 4 district, so as not to rob other parts of the colliery. I believe the returns from 17 have been proved satisfactory.

Gas, as proved by Charles Roberts, on No. 4 return, I cannot possibly explain, as we had a large quantity of wind passing there, which I have often examined, but never but once found the least cap, and it was that stated by William Walters. I can only regret that I was not informed of it. As to gas being found in the colliery, knowing the nature of the roof, with the bumpers continually going off in the face of the workings, which frequently

knocks out the top coal with props right under it, I cannot see that it can possibly be avoided, and I think it has been sufficiently proved that gas was not allowed to remain anywhere for any longer time than would enable firemen to clear it.

As to cause of explosion, and where it occurred, I will at once frankly state that I do not for a moment believe it occurred through the wilful neglect of any man working in the pit, as I consider them to be as careful a body of men as ever went down a pit; of the overmen and firemen I may also say the same.

That a body of gas came off, we must admit; how or from where I am quite unable to say: possibly a lump of coal may have suddenly fallen and damaged a lamp about the same time and fired the gas.

(signed) *Christopher Pond*,
Manager, Abercarn Colliery.

P.S.—I am firmly of opinion that the explosion occurred in the first place in 21 district, the blast having come out both the intake and return to the shaft, also following up John Roberts' heading toward Cwmcarn Pit, and into 17 district, the choke damp would then be carried gradually through 17 district and back towards No. 4. I am also of opinion that gas fired in 17.

That no explosion occurred in No. 4 can, I think, be easily shown, as the doors leading into long stable would undoubtedly have been blown to pieces; but we found that these doors were but little injured after clearing out colliery.

Cross-examination of Mr. *Pond*.

By Mr. *Cadman*.] There is no difficulty in sending air into No. 17. There would be no baffling of the air above. I have noticed the air repeatedly. We had no difficulty with the last alteration, or with the gas in 21 district, except once, when we engaged in making that alteration. This was about August. We made an experiment one Saturday afternoon. After we got through (at Cwmcarn) there was an increase to 6,000, 7,000, 8,000 cubic feet. It was the order that the day and night overman should seek and find me, and report any danger that might be present. I was away when an alteration was made. About three weeks after Gay reported gas in Joseph Smithers's road; and George Evans' road in George Evan's level; it was about three yards long and a foot deep. I turned the men out and cleared off the gas. I altered the ventilation by sending it through "New found out." Everything was cleared, the ventilation was good, and the air ample. In 21 district there was not any place left open where gas could have accumulated. The places were filled better in long-wall than in the pillar-and-stall system. After Cwmcarn was through we had more wind in the faces, far more of it. Before it was through there were 90,000 cubic feet per minute, and after that was completed 136,000 feet per minute. I have been down the pit, and up No. 4, as far as the men have been working, something over 500 yards. I saw no signs of fire on the timbers there, or any effect of fire. The timber was not affected in that place in any way by the explosion.

By Mr. *Morgan*.] I am 32. Since June 1873 I have held a certificate as manager. This is the first colliery I have managed. I was here before that. I commenced on the 1st of February 1873 at Abercarn. From 1860 to end of 70 or 71, I had experience at Tredegar, latterly as a surveyor to the Tredegar Iron Company. I was principally underground. I received a certificate of competency. I succeeded Mr. Needham. Tredegar is scarcely to be called the Black Vein. That at Tredegar is also steam coal, but not exactly like Abercarn. This colliery is not so extensive as when I came to it. When I came there were about 800 hands, all told. At the time of the explosion there were about the same. There may have been an increase to about 40 or 50 men since then. When I came there were four districts $\left\{\frac{21}{22}\ \frac{17}{18}\right\}$ four and two. There was not a separate return-road for each district then. The pit was in good working order when I came to it. The pressure of the air, on the day of explosion, was 19·24. The bottom of Cwmcarn Pit shaft is 120 yards higher than Abercarn. I did not think it necessary to take the measure at the intake; we always measured the air in the return, to see what was there, but of 23,560 cubic feet, 15,000 would pass through one face. In No. 21 district there would be 120 men working, or even 135. There would be over 100 colliers. There were 50 working-places there. From the old clip on, there would be 150. There were 12 or 13 horses, at least, in that district. There was 275 feet of air per man in No. 21. I do not agree with Mr. Thomas Joseph when he states in his third suggestion as to "Management," that each horse vitiates as much air as 10 men. One horse would vitiate as much as seven or eight men on the average: 3rd April the registered amount of air passing through was 22,420 cubic feet; 4th April, 23,560 cubic feet per minute. It was then, as more lately, measured at A. No. 1, as marked on this plan (*see* Plan). There is a station at No. 2 for 19. At that last-named station the registered amount of air passing through there on 3rd April was 16,340 cubic feet, and on 4th April was 16,720 cubic feet per minute.

LISTS of KILLED AND SAVED referred to in the accompanying PLAN.

LIST OF KILLED.

No. on Plan.	NAMES.	Occupation.	District.	REMARKS.
1	James Lovell	Collier	21 District.	
	William Lagg	ditto.		
2	William Lewis	ditto.		
	Edwin Davies	ditto.		
3	Thomas Davies	ditto.		
4	Daniel Davies	ditto.		
	Henry Owens	ditto.		
5	George Adams	ditto.		
	John Lee	ditto.		
6	James Hancock	ditto.		
	George Watts	ditto.		
7	John Coker	ditto.		
	Thomas Morgan	ditto.		
8	John Evans	ditto.		
	Thomas Evans	ditto.		
9	John Rowe	ditto.		
	Thomas Williams	ditto.		
10	Solomon Jones	ditto.		
	Jonathan Williams	ditto.		
11	Benjamin Coward	ditto.		
	William James	ditto.		
12	John Hodges	ditto.		
	John Hodges, jun.	ditto.		
13	George Giles Coombs	ditto.		
	Griffith England	ditto.		
14	William Downs	ditto.		
	John Everett	ditto.		
15	James Whatley	ditto.		
	Frederick Dole	ditto.		
16	Thomas Nelmes	ditto.		
	Charles Nelmes	ditto.		
17	Henry Quick	ditto.		
	James Quick	ditto.		
18	George Osborne	ditto.		
	Thomas Jones	ditto.		
19	Isaac Watts	ditto.		
	John Matthews	ditto.		
0	George Evans	ditto.		
	Thomas Ashman	ditto.		
21	George Eatwell	ditto.		
	William Hooper	ditto.		
22	George Sheppard	ditto.		
	Robert Osborne	ditto.		
23	Henry Cartwright	ditto.		
	Herbert Cartwright	ditto.		
24	William Morgan	ditto.		
25	James Griffiths	ditto.		
	Henry Cooksley	ditto.		
26	William Jones	ditto.		
	John Macarty	ditto.		
27	Thomas Smith	ditto.		
	John Williams	ditto.		
28	Joseph Clifford	ditto.		
	William Clifford	ditto.		
29	William Arnold	ditto.		
	William Preece	ditto.		
30	David Thomas	ditto.		
	Thomas Phillips	ditto.		
31	Richard Stephens	ditto.		
	John Stephens	ditto.		
32	Isaac Williams	ditto.		
	William Henry Davies	ditto.		
33	William Games	ditto.		
	Joseph Railton	ditto.		
34	Henry Gillingham	ditto.		
	Frederick Stephens	ditto.		
35	George Meredith	ditto.		
	Henry Meredith	ditto.		
36	Frederick Chin	ditto.		
37	George Oxford	ditto.		
	Henry Williams	ditto.		
38	Oliver Hibbs	ditto.		
	Edwin Evans	ditto.		
	Joseph Moore	ditto		Supposed to be with Oliver Hibbs.
39	John Chapman	ditto.		
	James Price	ditto.		
40	Henry Downs	ditto.		
	William Terrell	ditto.		
41	Job Webb	ditto.		
	Thomas Webb	ditto.		
42	Henry Knight	ditto.		
	Thomas Williams	ditto.		
43	Charles Jones	ditto.		
	Thomas Franklin	ditto.		
44	William Symonds	ditto.		
	William Henry Symonds	ditto.		
45	Samuel Moreton	ditto.		
	Isaac Bath	ditto.		
	1 Joseph Gay	Overman.		
	2 Henry Terrell	Fireman.		
	3 William Young	Roadman.		
	4 John Cridland	Lampman.		
	5 William Whatley	Labourer.		
	6 William Williams	ditto.		
	7 James Beard	ditto.		
	8 John Bakerton	Shackler.		
	9 George Brooks	ditto.		
	10 Thomas Watkins	ditto.		
	11 Byron Watkins	ditto.		
	12 Albert Wilcox	Rope connector.		
	13 George Payne	Light carrier.		
	14 William Lewis	Master haulier.		
	15 Michael Regan	Haulier.		
	16 John Regan	ditto.		
	17 Thomas Phillips, 1st	ditto.		
	18 David Evans	ditto.		
	19 William Phillips, 1st	ditto.		
	20 William Phillips, 2nd	ditto.		
	21 William Jones, 1st	Haulier	21 District.	
	22 William Jones, 2nd	ditto.		
	23 Thomas Davies	ditto.		
	24 George Gleade	ditto.		
	25 Wm. Jenkin Thomas	ditto.		
	26 William Allen	ditto.		
	27 Gilbert Gleade	ditto.		
	28 Samuel Powell	Sweeper.		
	29 Henry Nicholas	ditto.		
	30 Alfred Webb	ditto.		
	31 Richard Abram	Door boy.		
	32 Frank Whatley	ditto.		
	33 Samuel Terrell	ditto.		
	34 Thomas Phillips, 2nd	ditto.		
	35 Elihu Gay	ditto.		
	36 Edwin Williams	ditto.		
	37 Gwyllym Evans	Rope connector.		
	38 William Terrell	ditto.		
	39 Sydney Watkins	Sweeper.		
	40 John Carter	Collier		Working place not known.
	41 Frederick Chaddick	ditto		ditto ditto.
	42 Thos. Henry Symonds	ditto		ditto ditto.
	43 John Evans	ditto		ditto ditto.
45a	Silas Smith	Collier.		
	James Smith	ditto.		
46	John Edwards	Collier	22 District.	
	1 Isaac Madley	Haulier.		
47	John Games	Collier	17 District.	
48	Rees Howells	ditto.		
49	William Edwards	ditto.		
	Thomas Tyler	ditto.		
50	William Rogers	ditto.		
	Henry Saunders	ditto.		
51	David Beachy	ditto.		
	David Thomas	ditto.		
52	Thomas Lewis	ditto.		
	David Davies	ditto.		
53	Thomas Palmer	ditto.		
	William Palmer	ditto.		
54	William Morgan	ditto.		
55	Charles Greenland	ditto.		
	George Lloyd	ditto.		
56	Charles Baker	ditto.		
	John Franks	ditto.		
57	Thomas Noot	ditto.		
	Thomas Noot, jun.	ditto.		
58	Frederick Charlton	ditto.		
	Lewis James	ditto.		
	George Hillburn	ditto.		
	William Hillburn	ditto.		
59	John Jenkins	ditto.		
	John Reynolds	ditto.		
60	Augustus Thomas	ditto.		
	David Thomas	ditto.		
61	Thomas Abrahams	ditto.		
	George Abrahams	ditto.		
62	Henry Portray	ditto.		
	Edmund Jones	ditto.		
63	Thomas Waters	ditto.		
64	Henry Watts	ditto.		
	Alfred Davies	ditto.		
65	John Williams	ditto.		
	Edward Williams	ditto.		
66	George Coles	ditto.		
	Arthur Harris	ditto.		
67	William Marshall	ditto.		
	Charles Moore	ditto.		
68	Elias Nicholas	ditto.		
	James Poelry	ditto.		
69	Richard Williams	ditto.		
	Aaron Winters	ditto.		
	1 Edwin Bethel	Under viewer.		
	2 David Rees	Overman.		
	3 Thomas Phillips	Fireman.		
	4 John Lewis	Master Haulier		Supposed to be in this District.
	5 David James	ditto.		
	6 William Harlowe	Haulier.		
	7 James Davies	ditto.		
	8 Henry Budd	ditto.		
	9 William Carter	ditto.		
	10 David Rees	ditto.		
	11 David Griffiths	ditto.		
	12 John Lewis	ditto.		
	13 Albert Watkins	Roadman.		
	14 William Brown	Light carrier.		
	15 William Meyrick	Shackler.		
	16 Henry Waters	ditto.		
	17 Robert Noot	Door boy.		
	18 Henry Chas. Jennings	ditto.		
	19 Albert John Symonds	ditto.		
	20 John Harris	ditto.		
	21 Israel Lewis	Repairer.		
	22 John Davies	ditto.		
	23 William Stone	ditto.		
	24 Jacob Williams	ditto.		
	25 Joseph Lewis	ditto.		
	26 Frank Brimson	Labourer.		
	27 William Warmouth	ditto.		
	28 David Davies	ditto.		
	29 Thomas Francis	ditto.		
	30 Edwin Dew	ditto.		
	31 Uriah Parry	ditto.		
	32 Thomas Evans	ditto.		

LIST OF KILLED – *continued.*

No. on Plan.	NAMES.	Occupation.	District.	REMARKS.
70	Joseph Jones	Collier	4 District.	
	Daniel Williams	ditto.		
	William Williams	ditto.		
71	John Matthews	ditto.		
	Joseph Lewis	ditto.		
72	Rowland James	ditto.		
	Edmund Williams	ditto.		
73	John Colley	ditto.		
	William Colley	ditto.		
74	Thomas Wilks	ditto.		
	David Anthony	ditto.		
75	Thomas Walters	ditto.		
	Thomas Walters, jun.	ditto.		
76	Daniel Williams	ditto.		
	Alfred Wells	ditto.		
77	John Rees	ditto.		
	John Havard	ditto.		
78	Richard Saunders	ditto.		
	Morgan Bowden	ditto.		
79	Thomas Rogers	ditto.		
80	John Newbury	ditto.		
	William Howells	ditto.		
	1 James Harris	Fireman.		
	2 William Davies	Master Haulier.		
	3 William Davies, jun.	Haulier.		
	4 John Edwards	ditto.		
	5 John Williams	ditto.		
	6 John Daniel	ditto.		
	7 Joseph Hooper	Haulier	4 District.	
	8 David Davies	Shackler.		
	9 Isaac Matthews	Labourer.		
	10 William Snellgrove	ditto.		
	11 Thomas Williams	Repairer.		
	12 Isaac Sheppard	ditto.		
	13 James Bown	ditto.		
	14 Edward Symonds	ditto.		
	15 Thomas Haycock	ditto.		
	1 Joseph Jordan	Foreman	Pit Bottom.	
	2 Benjamin Games	Engineman.		
	3 Henry Golding	Hitcher.		
	4 Nathaniel Jones	ditto.		
	5 William Hopper	ditto.		
	6 John Beake	ditto.		
	7 Edward Jenkins	Haulier.		
	8 Henry Powell	ditto.		
	9 James Payne	ditto.		
	10 John Gough	ditto.		
	11 Thomas Phillips	Ostler.		
	12 Richard Richards	ditto.		
	13 John Hall	ditto.		
	14 Charles Nicholas	ditto.		
	15 Joseph Cains	Lampman.		
	16 John Regan	Oiling.		
	17 Charles Cudland	Dickey rider.		
	18 William Williams	Light carrier.		
	19 Wm. John Williams	Haulier.		

LIST OF SAVED.

No. on Plan.	NAMES.	Occupation.	District.	REMARKS.
1	Hezekiah Harvey	Collier	17 District.	
	Harvey	ditto.		
2	Thomas Games	ditto.		
	Solomon Morgan	ditto.		
3	Israel Bateman	ditto.		
	David Lewis	ditto.		
4	Samuel Toplass	ditto.		
5	Francis Morgan	ditto.		
	Morgan	ditto.		
6	Thomas Williams	ditto.		
	Williams	ditto.		
7	John Lavender	ditto.		
	Seth Sheppard	ditto.		
8	Charles Roberts	ditto.		
	William Gerrish	ditto.		
9	Thomas Smith	ditto.		
	Alford Davies	ditto.		
10	Thomas Bryant	ditto.		
11	William Prosser	ditto	2 District.	
	John Cook	ditto.		
12	George Carter	ditto.		
13	Thomas James	ditto.		
13	William Pritchard	ditto.		
14	Thomas Gooding	ditto.		
	George Lewis	ditto.		
15	Benjamin Morgan	ditto.		
	William Nicholas	ditto.		
16	Francis Lewis	ditto.		
	George Lewis	ditto.		
17	Jonah Jones	ditto.		
	W. H. Jones	ditto.		
18	John Fletcher	ditto.		
	John Knight	ditto.		
19	William Dobbs	ditto.		
	John Baker	ditto.		
20	James Speed	ditto.		
	James Nicholas	ditto.		
21	John Davis	ditto.		
22	George Moon	ditto.		
	1 George Ashman	Master Haulier		
	2 William Davies	Haulier.		
	3 Edward Haycock	ditto.		
	4 James Morgan	ditto.		
	5 Morgan Evans	ditto.		
	6 David Williams	Shackler.		
	7 James Haycock	Roadman.		
	8 Richard Williams	Dickey rider	2 District.	
	9 Michael Richards	Repairer.		
	10 David Davies	ditto.		
	11 William Mansfield	Mason.		
	12 Charles Mansfield	ditto (boy).		
	13 John Morgan	Door boy.		
	14 Thomas Osborne	Oiling.		
	15 John Jordan	Engineman	Pit bottom.	
	William Anthony	Collier	2 District.	
23	Thomas Meredith	ditto.		
	William Davies	ditto.		
24	Matthew Morgan	ditto.		
	John Morgan	ditto.		
25	John Owens	ditto.		
	Thomas Powell	ditto.		
26	John Davies	ditto.		
	William Davies	ditto.		
27	Thomas Eatwell	ditto.		
	Anthony Dew	ditto.		
28	John West	ditto.		
	William West	ditto.		
29	Henry Lewis	ditto.		
	James Bassett	ditto.		
30	John Sweet	ditto.		
	John Jones	ditto.		
31	Joseph George	ditto.		
	Thomas Waters	ditto.		
32	William Jenkins	ditto.		
	Morgan Morgans	ditto.		
33	Thomas Allsopp	ditto.		
	Allsopp	ditto.		
34	William Williams	ditto.		
	John Williams	ditto.		
35	Richard Edwards	ditto.		
	John Evans	ditto.		
36	Lemuel Charles	ditto.		
	Daniel Jones	ditto.		
37	Henry Carter	ditto.		
	William Jones	ditto.		
38	James Absalon	ditto.		
	David Absalon	ditto.		
39	Thomas Jones	ditto.		
	Emmanl. Sheppard	ditto.		
40	John Evans	ditto.		

SPECIAL RULES applicable to the ABERCARN COLLIERY, in pursuance of the MINES REGULATION ACT, 1872.

Certificated Manager.

1. THE certificated manager has the responsible charge and direction of the mines and works, and all persons employed in or about the same. He has full power, and is required to carry out, whatsoever may be necessary for safety, and for rendering effective the provisions of the Act and Special Rules.

Under-viewer.

2. The under-viewer, acting under and according to the orders of the certificated manager, shall have full power over all persons employed about the mines and collieries to which these rules apply, and shall see that the provisions of the Act and Special Rules are observed and carried out; and in event of any accident happening or any derangement of the workings, or infringment of the rules, he shall report the same at once to the certificated manager.

Overmen and their Deputies.

3. Under the certificated manager and under-viewer, the overmen shall have full and responsible charge of the workings committed to their charge, and they shall have full authority over the firemen, or deputy overmen, and all other persons employed in the collieries and mines, over which they have supervision.

4. The overmen, or their deputies, under the 29th General Rule, shall, once at least in every 24 hours, examine the working places, levels, planes and other works of the mine which are in actual use, and shall, once at least in every week, examine the state of the shafts by which persons ascend or descend, and the guides or conductors therein, and shall make a true report of such examination, and such report shall be recorded in the book to be kept by the person whose duty it is to make the same.

5. They shall see that all roads are kept in a safe state by removal or otherwise of overhanging stones, or coal, or loose sides, and shall take care that a sufficient supply of suitable timber shall, after having been selected by the workmen from the stock at the mine, be delivered at the mouths of their working places; that the timbers are set in the best manner in all places where they are required, with sprags or other props, and that each working place is examined as often as necessary.

6. The overmen and their deputies shall take care that proper stops, brattices for working places, airways and doors, be immediately put where required, and kept in repair; and that all airways and everything connected therewith, and stables, be kept clean and in good order. The air from the stables shall be prevented from mixing with the intake current of air.

7. All doors for ventilation shall be so hung that they will not stand open of themselves. The main doors shall be double or treble if necessary. The ventilating furnace or other power shall be kept in proper order, and regularly worked. The man in charge shall not leave till the arrival of some one to take his place, or until he has communicated with the overman.

8. The overman shall not allow any boy under 12 years of age to enter the mines.

9. They, and each of them, shall report to the certificated manager or under-viewer, any breach of, or omission to fulfil, the provisions of the Act or Special Rules, by any person employed in and about the mine, immediately after such breach or omission shall have been discovered.

Firemen.

10. The firemen, or deputy overmen, in mines where such rules respectively apply, shall be the persons to carry out the provisions of the General Rules 2, 3, 6, and 8, and it shall be their duty to place cross timbers to bar the entrance to every working place or way into which it is intended that the workmen shall not enter. No air in an explosive condition shall be carried over the furnace or within 20 yards of the same.

11. Before each shift of men, and before men are permitted to enter the mine, the fireman or deputy overman shall examine each working place, and the roadways leading thereto, to see that there is no danger from gas, or from roof or sides, or any other contingency that would render any working place unsafe.

12. They and each of them shall report to those in authority over them, any breach of or omission to fulfil the provisions of the Act or Special Rules by any person in and about the mine, immediately after such breach of omission shall have been discovered.

Engineers, Enginemen, and others.

13. The engineer, or some competent person to be appointed by him or the certificated manager, shall examine the state of the machinery, and the state of the head gear, ropes and chains, as provided by the 29th General Rule.

14. Any breakage, derangement, or defect in the machinery, shall be at once reported by the engineman or breaksman to the certificated manager or engineer.

15. Every engineman in charge of any engine shall attend to it constantly during his turn, and upon no account permit any person, except such as may be appointed by the certificated manager or engineer, to touch any portion of the machinery, nor remain in the engine-house; he shall also "hand" his engine slowly, and with great care, when any person is descending or ascending the shaft; and he shall run the rope or chain slowly once up and down, before the first person of any shift descends, in order that it may be examined by the banksman.

16. Every breaksman in charge of balance machinery shall attend to it constantly during his turn, and upon no account permit any person, except such as may be appointed by the certificated manager or engineer, to touch any portion of the machinery. He shall run the rope or chain slowly once up and down the shaft before the first person of any shift descends, and he shall stand to the break whenever any person is riding in the shaft.

17. The signals, as directed by the certificated manager, shall be given by the banksman and hitcher, and carefully observed by them and the engineman. In case anything appears to be defective or irregular, the engineman or breaksman shall immediately stop the machinery, and not proceed until it has been remedied and the proper signal has been given.

18. The engineman shall attend particularly to all safety valves, steam gauges, and water gauges, that they may work freely; and he shall not alter the weights on the safety valves without authority from the certificated manager or engineer. The boilers shall be laid off and cleaned, and the plates over the fire and the stays carefully examined when necessary. The stoker shall act according to the directions of the engineman.

19. They and each of them shall report to those in authority over them any breach of, or omission to fulfil the provisions of the Act or special rules by any person in and about the mine, immediately after such breach or omission shall have been discovered.

Banksmen and Hitchers.

20. The banksman shall make the signals and have the control of the men at the shaft top. He shall carefully examine the carriages, ropes and chains, and their fastenings, especially before each turn of men are allowed to descend. No person except those employed about the mines shall be allowed to descend, nor remain on the bank without the permission of the certificated manager. All intoxicating liquors and persons who are not sober shall be prevented from entering the mine.

21. The hitcher shall make the signals and have the control at the shaft bottom. No material must be sent up the shaft projecting beyond the carriage. The hitcher shall prevent any person from crossing or being under the shaft while it is at work.

22. The banksman and hitcher shall be at their respective posts during the whole time persons are descending or ascending the shaft. They shall make a special signal and receive a reply when persons are about to ride, and shall immediately stop them as soon as any irregularity or source of danger is discovered. Another signal shall be made when ready for starting. The banksman and hitcher shall prevent more than eight persons from riding at once in a single carriage upon any occasion. No person shall be allowed to ride on the side or top of the tub or carriage, nor to get in or out till it comes to rest. No coal, stone, materials, or tools, shall ascend or descend whilst the men are riding in the shaft or separate shafts worked by the same engine.

23. The banksman shall report at once to the engineman any source of danger. He shall see that the fencing of the shaft is properly adjusted at the top.

24. They and each of them shall report to those in authority over them, any breach of or omission to fulfil the provisions of the Act or Special Rules by any person in and about the mine, immediately after such breach or omission shall have been discovered.

Locked Safety Lamps.

25. The lamp keeper and examiner underground, appointed by the certificated manager, or under-viewer, or overman, shall be the competent person to carry out the provisions of the General Rule 7 in the Act.

26. The lamp-keeper and examiner underground shall see that all safety lamps and gauzes are properly cleaned, carefully examined, and properly repaired, and supplied with a sufficient quantity of oil and wick, and take care that the gauze of the lamp has not

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less than 28 holes to the lineal inch, and that it is firmly secured to the flame of the lamp by an inside ring, or equally safe means, and that it is perfect in every respect, and shall securely lock the lamp before giving it to any person employed in the mine.

27. In all cases where the lamps are returned, the lamp keeper shall at once examine them, and if injured or defective he shall report the circumstances to the overman.

28. The lamp keeper and examiner underground shall report to those in authority over them any breach of or omission to fulfil the provisions of the Act or Special Rules by any person in and about the mine, immediately after such breach or omission shall have been discovered.

Workmen and others.

29. Every person employed in any mines to which these Rules apply must make himself acquainted with the provisions of the Act and Special Rules, and carry out the orders of the certificated manager, under viewer, overmen, and firemen, in the several matters over which those officers respectively have authority.

30. No person shall descend or ascend the shaft except by the direction of the banksman or hitcher. No man or boy shall go into any other part of the mine than that where he is employed, under any pretext whatever; nor pass, nor remove any caution mark, except by order of the overman or fireman. No workman shall ride upon, nor be on the rails of any inclined plane, tram or railway, above or below ground, whilst it is at work, without the order of the manager. Every person passing through a door must not prop it open, but close it carefully.

31. Every man is responsible for the safety of his working-place. Every workman shall take care that he is supplied with timbers from the stock at the mine, and shall pay particular attention at all times to the state of the roof, and see that the timbers and sprags are set in the best possible manner. All air-courses, bratticings, or stowings shall be carried up sufficiently close to the face, according to the directions of the overman or fireman.

32. No person shall leave a lighted candle or other light in any part of the mine when leaving his work. No person shall injure any air-course, brattice, caution mark, door, or stopping; nor put coals, rubbish, or any other obstruction in any air-course; nor do any other act whereby the lives of the workmen or the security of the mine would be endangered. Every person discovering any door standing open which ought to be shut, any derangement of the ventilation, or injury to doors, stoppings, or brattices, finding any appearances of choke-damp, gas, or water, or seeing any danger in the roof of roads or headings, shall at once give notice to the overman or fireman, in order that the same may be remedied.

33. Every workman required to use a safety-lamp must assure himself that his lamp is locked before he enters the mine. When he has ceased to use his lamp it shall be returned to the lamp keeper.

34. Naked lights shall only be used at the bottom of the down cast pit, or on a slope where the fresh intake air is passing. All other parts of the mine shall be worked exclusively with locked safety-lamps.

35. Lamp stations (always in the main intake) shall, where necessary, be fixed upon by the certificated manager, and these stations shall be indicated by boards being put up with the words "lamp station" painted upon them. From these stations no safety-lamp shall be taken, except it shall have been examined and securely locked by the lampkeeper or some other responsible person.

36. No workman shall attempt to unlock or open a safety-lamp, or to light his pipe at the wire gauze, or to blow out the flame, remove the shield, or use the lamp in an improper manner. No person shall attempt to smoke, or take any unlocked safety-lamp, candle, lucifer matches, pipe, or any combustible materials beyond the "lamp station."

37. Every safety-lamp which may have oil spilled upon it, or which may be in any way injured, or rendered unsafe, shall be put out. The extinguished lamps shall be taken back to the nearest lamp station. Every workman using a safety-lamp shall frequently examine it, and should he detect by the usual indications the appearance or presence of fire-damp, he must pull down the wick with the pricker; and should a flame still continue in the interior of the lamp, he shall remove the lamp with the greatest possible care, it being particularly directed that he shall not attempt to extinguish the flame by any other means. He shall then without delay return to the nearest lamp station and inform the overman, fireman, or nearest responsible person.

38. No person shall "try" for fire-damp with a naked light, nor attempt to "brush out" any fire-damp.

39. Persons who neglect the Rules, or refuse obedience to the orders of any person in authority over them, are to be sent out of the mine with a view to the investigation of the case, and the punishment of the offender.

40. No person employing any men in and about the mines to which these Rules apply shall pay any wages at or within any public-house, beer-shop, or place for the sale of any

spirits, beer, wine, cider, or other spirituous or fermented liquors, or other house of entertainment, or any office, garden, or place belonging or contiguous thereto, or occupied therewith, and every person employed in or about the mines who shall become cognizant of any breach of this Rule, shall at once report the same to the certificated manager.

41. Every person employed in and about the mines shall ask for and receive a copy of the Abstract of the Act and Special Rules, and he shall return the same when he ceases to be employed at the mines.

42. They and each of them shall report to those in authority over them any breach of or omission to fulfil the provisions of the Act or Special Rules by any person employed in and about the mine, immediately after such breach or omission shall have been discovered.

ABSTRACT OF COAL MINES REGULATION ACT, 1872.

Application of Act.

1. The Act applies to—
   (1.) Coal mines.
   (2.) Mines of stratified ironstone.
   (3.) Mines of shale.
   (4.) Mines of fire-clay.

2. *Definition of Mine.*—The term "mine" includes every shaft in the course of being sunk, and every level and inclined plane in the course of being driven, for commencing or opening any mine, or for searching for or proving minerals, and all the shafts, levels, planes, works, machinery, tramways, and sidings, both below ground and above ground, in and adjacent to a mine, and any such shaft, level, and inclined plane, and belonging to the mine.
The term "shaft" includes pit.
Where two or more parts of a mine are worked separately, each of such parts may, after notice, be constituted a separate mine for the purposes of the Act. A Secretary of State, however, may object thereto, and the owner or agent must acquiesce in such objection or refer the matter to arbitration.

3. The commencement of the Act is, for England and Scotland, 1st January 1873; for Ireland, 1st January 1874.

Inspectors.

4. Inspectors of mines are to be appointed by a Secretary of State, and a district to be assigned to each, The existing inspectors are to continue to act.

5. An inspector may not himself be, or practice, or be the partner of one who is or who practices, as land agent or mining engineer, or as a manager, viewer, agent, or valuer of mines, or as arbitrator in mining cases, and may not be otherwise employed in or about any mine, whether such mine is one to which the Act applies or not.

6. In order to ascertain whether the provisions of the Act are observed both above ground and below ground, the inspector is authorised to examine any mine by day or by night, so, however, as not to impede the working thereof; and owners, agents, and managers, and all employed in or about the mine, are bound to render him every assistance in conducting such examination.

7. He is to make to the Secretary of State an annual report of his proceedings to be laid before Parliament, and when directed is to make a special report as to any mine accident attended with loss of life or personal injury. Such special report will be made public in the mode and at the time directed by a Secretary of State.

Manager.

8. *Rule.*—Subject to the exceptions mentioned below, every mine must be under the control and daily supervision of a certificated manager.

9. *Exception No.* 1.—The rule requiring a manager does not apply to a mine in which less than 30 persons are ordinarily employed below ground, unless the inspector of the district insists upon it.

10. *Exception No.* 2.—The rule requiring a manager does not apply to a mine the average daily output of which does not exceed 25 tons, unless the inspector of the district insists upon it.

11. *Exception No.* 3.—In special circumstances, notified to the inspector of the district, a manager may be temporarily dispensed with.

12. The certificate, given by a Secretary of State is either a certificate of *service*, given only to persons who before 10th August 1872 was acting, and have since then acted, in the capacity of manager of a mine, or who since 10th August 1876, have acted in a like capacity for more than 12 months; or a certificate of *competency* given after examination, and upon proof of sobriety, experience, ability, and general good conduct. The examination is conducted by examiners appointed by a district board, and the members of such district board are appointed by the Secretary of State, and consist of three owners, agents, or managers of a mine within the district, three persons employed in or about a mine within the district, not being owners, agents, or managers, three mining engineers, agents, managers, or coal viewers within the district, and an inspector of mines. The area of the district is fixed by a Secretary of State.

13. The owner or agent may nominate either himself or any other person as manager, but the manager must not be a contractor for getting the mineral, or in the employ of a contractor.

14. A Secretary of State on a representation made that a certificated manager is by reason of incompetency or gross negligence unfit to discharge his duties, or has been convicted of an offence against the Act, may order a court of inquiry to be held, and on the report of the court, cancel or suspend the certificate. He may also restore a certificate cancelled or suspended.

15. A register of certificated managers is kept under the direction of a Secretary of State.

Restrictions as to Employment Under Ground.

16. *Women and girls of any age* may not be employed at all.

17. *Boys under* 12 may not be employed at all, unless the mine is specially exempted by the Secretary of State by reason of the thinness of the seam, when, subject to certain conditions stated in the exemption, boys between 10 and 12 may be employed. (*See exemption set forth below, paragraph No.* 71.)

18. *Boys of* 12 *and under* 13, *and male young persons of* 13 *and under* 16, may be employed not more than 54 hours a week, or more than 10 hours a day, and are to be allowed an interval of 12 hours for rest between each two consecutive periods of employment, except between Friday and Saturday, when an interval of eight hours will suffice.

19. A week begins at 12 p.m. Saturday, and ends at 12 p.m. the Saturday following.

20. A period of a person's employment begins at the time of his leaving the surface, and ends at the time of his returning to the surface.

21. The immediate employer of any boy of 12 and under 13, and of any male young person of 13 and under 16, is not to take him below ground until he has reported his intention so to do to the manager, or to some person apppointed by the manager.

Restrictions as to Employment Above Ground.

22. *Children under* 10 *of either sex* may not be employed at all.

23. *Children of* 10 *and under* 13 *of either sex* may be employed, but—
(*a*) not for more than six days a week, and
(*b*) not for more than six hours a day, if employed for more than three days in a week, and
(*c*) not for more than 10 hours a day if employed for only three days, or less than three days in a week.

24. For children so employed an interval of 12 hours for rest must be allowed between two consecutive periods of employment, except between Friday and Saturday, when an interval of eight hours will suffice.

25. *Schooling.*—The parent or guardian of, or person having the custody or control of any child so employed must see that the child attend school (except in the case of there being no school which the child can attend within two miles of his or her home, or of the mine). Such attendance must be for at least 20 hours in every two consecutive weeks of employment, and any attendance is not to count if it is—

1. In excess—
(*a*) of three hours at a time, or
(*b*) of five hours in a day, or
(*c*) of 12 hours in a week, or
2. On Sundays, or
3. Before 8 a.m. or after 6 p.m.

26. It will be the duty of the immediate employer, after employing a child for a fortnight, to obtain from the teacher, every Monday morning during the continuance of the employment, a certificate of the child's attendance at the school during the preceding week, and to deliver the certificate to the owner, agent, or manager, who must keep the same in the office at the mine for six months for production to the inspector.

27. Also the person who pays the child's wages must, after a single application of the teacher, pay regularly every week the cost of the child's schooling (not exceeding 2*d.* a wrek, or one-twelfth of the child's wages), and he may deduct from the child's wages any sum so paid.

28. A teacher who is unfit, or who misconducts himself, is liable to be disqualified by an inspector of mines for granting certificates of attendance, subject to an appeal to the Education Department.

29. *Young persons of* 13 *and under* 16 *of either sex, and women above* 13, may not be employed more than 54 hours a week, or more than 10 hours a day, and must be allowed an interval of 12 hours for rest between two consecutive periods of employment, except between Friday and Saturday, when an interval of eight hours will suffice.

30. *Children of* 10 *and under* 13, *of either sex, young persons* 13 *and under* 16, *of either sex, and women above* 13, may not be employed,—

1. Between 9 p.m. and 5 p.m., or
2. On Sundays, or
3. After 2 p.m. on Saturday;

Also they are to be allowed intervals for meals, namely—

Half an hour during a period of employment which exceeds five hours.
One and a half hours during a period of employment which exceeds eight hours.

A mine in Ireland may be exempted by the Secretary of State from the provisions as to the Saturday half-holiday. (*See Exemptions set forth below, paragraph* 72.)

Who may be employed about an Engine.

31. The person who is in charge of any engine, windlass, or gin, howsoever worked, which is used for the purpose of taking persons up or down or along any shaft, incline plane or level (being either an entrance to a mine or a communication from one part of a mine to another), or who is in charge of any part of the tackle of such engine, windlass, or gin, must be a male of at least 18 years of age.
If the engine, widdlass, or gin is worked by an animal, then not the driver but the person under whose directions the driver acts is to be deemed the person in charge; but in that case the driver must not be under 12 years of age.

Penalty for Misrepresentation of Age.

32. Any parent or guardian misrepresenting the age of any person with a view of procuring him employment in contravention of the Act will be liable to punishment.

Wages.

33. *Not to be paid in a public-house, &c.*—Wages are not to be paid on any premises used for the sale of intoxicating liquor, or in any place contiguous to such premises.

Weighing.

These weighing Provisions do not come into force until 1*st August* 1873.

34. Payment by day on yardage is allowed, but in any mine, unless expressly exempted (*see below, paragraph No.* 73), where the amount of wages depends on the amount of mineral gotten, the wages are to be paid according to the standard weight in pounds avoirdupoise of the mineral gotten.

35. The weighing machines and weights are subject to the inspection of the inspectors of weights and measures.

36. *Check-weigher.*—The persons employed in a mine may, if they think proper, appoint a check-weigher at their own cost. The check-weigher must be a person employed either in the same mine or in another mine belonging to the same owner. He is entitled to have every facility afforded to him to take a correct account of the weighing, but he is not to impede the working of the mine, or interfere with the weighing; and in his absence the weighing may be carried on without him. He is liable to be removed by the magistrates for misconduct, and in that case another may be selected to fill his place.

37. The weighing provisions expressly sanctions agreements to be made between employers and employed for deductions on account of "dirt" or "shorts," the words of the Act being, "Nothing herein contained "shall preclude the owner, agent, or manager of the mine from agreeing with the persons employed in such "mine that deductions shall be made in respect of stones or materials other than mineral contracted to be "gotten which shall be sent up from the mine with the mineral contracted to be gotten, or in respect of any "tubs, baskets, or hutches being improperly filled, in those cases where they are filled by the getter of the "mineral, or his drawer, or by a person immediately employed by him."

Such deductions are to be determined by the banksman or weigher and check-weigher, or, in the event of difference by a third person, to be mutually agreed upon by the owner, agent, or manager, on the one hand, and the persons employed in the mine on the other.

Prohibition of Single Shafts.

38. *Rule.*—Subject to the exceptions stated below, and to any exemption specially granted, every mine must have two shafts or outlets in communication with every seam at work, which are capable of affording distinct means of ingress and egress to the persons employed in the seam. These shafts need not belong to the same mine. They must be separated by natural strata of not less than 10 feet in breadth, though openings may be made through the strata for such purposes as ventilation and drainage. Such openings however, must, in the case of mines where inflammable gas has been found within the preceding 12 months, be only temporary. Between the two shafts or outlets there must be a communication not less than four feet wide and three feet high. At each of the shafts or outlets, or on the works belonging to the mine, there must be kept for raising and lowering persons proper apparatus in actual use or available for use within a reasonable time.

39. *Exception No.* 1.—The rule does not apply to the case of a new mine being opened for the purpose of searching for or proving minerals, so long as not more than 20 persons are employed below ground at any one time in the whole of the different seams in connection with shaft.

40. *Exception No.* 2.—The rule does not apply to any working for the purpose of making communication between two or more shafts, so long as not more than 20 persons are employed below ground at any one time in the whole of the different seams in connection with each shaft or outlet.

41. *Exception No* 3.—The rule does not, in the case of mines which before the passing of the Act were not required to have a double shaft, come into operation till the 1st of January 1875.

42. In certain cases temporary or permanent exemption are allowed. (*See below, paragraph* 74.)

Fencing Abandoned Mines.

43. Where any mine is abandoned, or the working thereof discontinued (at whatever time such abandonment or discontinuance occurred), the top of the shaft and any side entrance from the surface must be kept securely fenced by the owner of the mine or the persons interested in the minerals thereof.

General Rules.

44. The Act prescribes general rules (set forth at length hereunder paragraph 76) which are to be observed, so far as is reasonably practicable, in every mine.

Special Rules.

45. In addition to the general rules, but not at variance with them, each mine must have its own set of special rules, framed to meet the special circumstances of the mine.

46. *Object.*—The object of special rules is—

1. To prevent dangerous accidents.
2. To provide for the proper discipline of those employed in the mine.

47. *Force*—Special rules have the same force as if they were contained in the Act.

48. *How made.*—Special rules are prepared in the first instance on behalf of the owner, and are, together with a notice, to be posted up during a fortnight on the premises; such notice to be printed and to be to the effect that at the end of the fortnight the rules will be submitted to the inspector of mines for the district, and that in the meantime any person employed in the mine is entitled to forward any objection to the inspector at his address, as stated in the notice. On the expiration of the fortnight they are to be signed by the owner, agent, or manager, and transmitted to the inspector, together with a certificate that the rules and the notice have been posted up as aforesaid.

49. A Secretary of State may, within 40 days, object to the special rules if they are insufficient or unreasonable, and require to be modified. These requisitions must be complied with, or else referred to arbitration.

50. After

50. After 40 days, special rules, if not objected to, become established, and are to be signed by the inspector of the district.

51. *At what time to be made.*—In mines having special rules in operation on 1st January 1873, proper steps must be taken before 1st April 1873, to submit a new set of special rules to the inspector. Meantime the existing special rules will continue in force.
In the case of a new mine being opened, or the workings of an old mine being renewed, the Act allows three months within which special rules may be submitted.

52. *Amendment.*—At any time special rules may be amended in like manner at the instance of the owner, agent, or manager.
Also, the Secretary of State may, at any time, propose amendments, which must be complied with, or referred to arbitration.

53. *Publication.*—A copy at full length of the special rules when made, and also of this abstract, together with the name and address of the inspector of the dist ict, and the name and address of the owner or agent or manager of the mine, must be kept posted up on the premises, and a copy thereof supplied gratis on application.

54. Any person who pulls down the documents so posted up is liable to punishment.

As to Dangerous Practices not expressly Prohibited.

55. If in any respect a mine is carried on in a manner which, though not expressly forbidden by the terms of the Act, or by special rules, is nevertheless dangerous, the inspector may require the matter to be remedied, and the owner, agent, or manager is bound to comply with the requisition, or else to submit to a reference to arbitration.

Penalties.

56. Breach of a general rule by any person, or of a special rule by any person bound to observe the same, is an offence against the Act. And in event of such an offence being proved to have been committed, the owner, agent, and manager will also each of them be guilty of an offence against the Act, unless he proves that he had taken all reasonable means to prevent the offence by publishing, and, to the best of his knowledge, enforcing the rules.
A like liability arises with respect to other provisions of the Act, the breach of which is declared an offence against the Act.

57. The penalty for an offence against the Act (except when another penalty is expressly specified) is—

(*a*.) If the offence be committed by a person employed in or about the mine.	Not exceeding 2 *l.*
(*b*.) If committed by the owner, agent, or manager.	Not exceeding 20 *l.*, and a further penalty not exceeding 1 *l.* per day for every day that such offence continues to be committed after a written notice from the inspector.

58. Where, however, the Court is of opinion that the offence is one which is reasonably calculated to endanger the safety of those employed in or about the mine, or to cause serious personal injury or dangerous accident, and was committed wilfully by the personal act, personal default, or personal negligence of the accused, and that a pecuniary penalty will not meet the circumstances of the case, the punishment may be imprisonment with or without hard labour, for three months.

59. An appeal lies in case imprisonment or half the maximum penalty has been adjudged.

60. An offence can only be prosecuted within three months after the date when it was committed.

61. An offence by an owner, agent, or manager cannot be summarily prosecuted, except either by an inspector of mines or with the consent of the Secretary of State.

62. The owner, agent, or manager may be sworn and examined as an ordinary witness, if charged in respect of any contravention or non-compliance by another person.

63. Penalties for neglecting to send notice of accident, or for any offence against the Act which has occasioned loss of life or personal injury, may be directed by the Secretary of State to be paid to the sufferers or to the relatives of deceased sufferers, but not to any person who has contributed to the neglect or offence.

64. A person who is the owner, agent, or manager of any mine to which the Coal Mines Regulation Act applies, or the father, son, or brother of such owner, agent, or manager, is disqualified from summarily adjudicating on any offence committed against the Act.

Miscellaneous.

65. *Register.*—The owner, agent, or manager must keep in the office at the mine, a register containing the particulars prescribed by Section 13 as to all persons whose hours of employment are regulated by the Act, and also a memorandum of the certificates of school attendance.
The register is to be produced to the inspector, who may inspect or copy it.

66. *Returns* are to be sent annually by the owner, agent, or manager of each mine to the inspector of the district, namely, on January 1st a return in the form given in Schedule 4 to the Act, and on or before February 1st a return in form to be prescribed by a Secretary of State specifying the particulars mentioned in Sect. 38 of the Act.

67. *Plans.*—The owner, agent, or manager is to keep in his office at the mine an accurate plan and section, or a tracing thereof, showing the workings up to at least six months previously, and is to produce it to the inspector of mines to examine, but not to copy, and if requested is to mark on the plan the workings up to the time of production.

68. *Plans on Abandonment.*—Within three months of the abandonment of a mine, a plan and section, or tracing thereof, showing the boundaries of the workings, are to be sent by the owner to a Secretary of State as a mining record, not, however, to be seen until after the lapse of 10 years, except by an inspector or by consent.

69. *Notices* must be sent by the owner, agent, or manager of a mine, to the inspector of mines for the district, as follows :—

1. Of the appointment of a manager, together with his name and address, immediately after his appointment; and in case of the temporary appointment of an uncertificated manager, the notice shall state the reason of such appointment.
2. Of any accident causing the loss of life or serious personal injury, within 24 hours after such accident.
3. Of any accident from explosion of gas, powder, or steam boiler, causing any personal injury, within 24 hours after such accident.
4. Of any death resulting from personal injury, caused by an accident previously reported, within 24 hours after the death comes to the knowledge of the owner, agent, or manager.
5. Of the commencement of any working for the opening of a new shaft.
6. Of the abandonment of a mine.
7. Of the re-commencement of the working of a shaft after an abandonment for more than two months.
8. Of any change in the name of the mine, or in the name of the owner, agent, or manager.
9. Of any change in the officers of any incorporated company owning a mine.

Within two months after the event to be notified.

Notice must also be given by the owner or agent (not by the manager) of the fact that two or more parts of a mine are worked separately, with a view that each may be deemed to constitute a separate mine for the purpose of the Act.

70. *Coroners' Inquests.*—In the case of an inquest being held concerning a death caused by a mine accident, unless the inspector, or some other person on behalf of a Secretary of State is present, the coroner is to adjourn the inquest, and to send to the inspector four days' notice of the time and place of the adjourned inquest.

If, however, only one life has been lost by the accident, and 48 hours' notice of the time and place of holding the inquest has been sent to the inspector, the inquest need not be adjourned if the majority of the jury think it unnecessary.

At the inquest the inspector of the mines may examine any witness, subject to the order of the coroner.

If the inspector is not present, and evidence is given of any neglect having caused or contributed to the accident, or of any defect in or about the mine appearing to require a remedy, the coroner is to send to the inspector notice thereof in writing.

In the event of a fatal accident occurring in a mine, and an inquest being held, no person who is employed in that mine, or is concerned in its management, or has a personal interest in that mine, is qualified to serve on the jury.

Exemptions.

71. *Employment of Boys in Thin Seam Mines.*—A Secretary of State may exempt a thin seam mine from the provisions (*see above, paragraph No.* 17) prohibiting employment below ground of boys under 12.

In a mine so exempted, boys of 10 and under 12 may be employed under-ground, but—

(*a.*) Not for more than six days a week;

(*b.*) Not for more than six hours a day, if employed for more than three days in a week;

(*c.*) Not for more than 10 hours a day, if employed for only three days, or for less than three days in a week.

An interval of 12 hours' rest shall be allowed between each two consecutive periods of employment, except between Friday and Saturday, when an interval of eight hours will suffice.

The period of each employment of a boy is deemed to begin at the time of his leaving the surface, and to end at the time of his return to the surface.

The week is deemed to begin at 12 p.m. Saturday, and to end at 12 p.m. on the Saturday following.

The immediate employer of any boy of 10 and under 12 is not to take him below ground until he has reported his intention so to do to the manager, or to some person appointed by the manager.

Boys of 10 and under 12 are subject to the same provisions with regard to *schooling* as are prescribed (*see above, paragraphs* 25, 26, 27, 28) for children under 13 employed above ground.

72. *Saturday Half-holiday, Ireland.*—A Secretary of State may exempt any mine in Ireland from the provision (*see above, paragraph* 30), prohibiting the employment above ground of women, young persons, or children, after 2 o'clock on Saturday afternoon.

73. *Weighing Provisions.*—A Secretary of State may grant an exemption from the weighing provisions (*see above, paragraph* 34) or postpone their operation with respect to any mine or class of mines as to which he is satisfied that such exemption or postponement is requisite or expedient by reason of the exigencies of the case.

In any mine so exempted, wages may be paid according to measure or gauge, and local measures and gauges may be adopted, subject, however, to inspection by the Inspectors of Weights and Measures. A check measurer may be appointed in like manner as a check weigher.

74. *Single Shafts.*—A Secretary of State may exempt a proved mine from the provisions (*see above, paragraph* 42) prohibiting single shafts:

(*a.*) If satisfied that the quantity of mineral proved is insufficient to repay the outlay of the sinking or making of a second shaft or outlet:

In a mine so exempted there must not be employed below ground at any one time in the whole of the different seams in connection with the shaft or outlet, more than 20 persons, or if the mine is not a coal mine or mine with inflammable gas, more than such other larger number as a Secretary of State may allow:

(*b.*) If the mine is not a coal mine or mine with inflammable gas, and the Secretary of State is satisfied that sufficient provision has been made against danger from other cause than explosion of gas by using stone, brick, or iron, in the place of wood in the lining of the shaft and the construction of the mid wall:

In a mine so exempted there must not be employed below ground at any one time in the whole of the different seams in connection with the shaft or outlet more than the number of persons the Secretary of State may allow:

(*c.*) If satisfied that the workings in a seam have reached the boundary of the property or the extremity of the mineral field, and that it is expedient to work away the pillars already formed in the course of the ordinary workings, notwithstanding that, by so working away the pillars, one of the shafts or outlets may be cut off:

In a mine so exempted there must not be employed below ground at any one time in the whole of the different seams in connection with the shaft or outlet more than 20 persons, or if the mine is not a coal mine or mine with inflammable gas, more than such larger number as the Secretary of State may allow:

(*d.*) If

(*d.*) If satisfied that by reason of an accident one of the shafts or outlets has become unavailable for the use of the persons employed in the mine:

A mine so exempted may only be worked subject to the condition specified in the exemption:

(*e.*) In the case of a mine not at the time of the passing of the Act required to have two outlets, provided that an application is made in England or Scotland within six months after 1st January 1873, or in Ireland within six months after 1st January 1874, and the Secretary of State is satisfied that the mine is nearly exhausted.

If the Secretary of State refuse to grant such exemption, the matter may be referred to arbitration.

75. Also in the case of a mine not at the time of the passing of the Act required to have two outlets, a Secretary of State may grant an extension of time (*see above, paragraph* 41) for providing an additional shaft or outlet, if an application is made to him within six months preceding 1st January 1875.

In the event of the Secretary of State refusing such extension of time, the matter may be referred to arbitration.

General Rules.

76. The following are the General Rules:—

Ventilation.

(1.) An adequate amount of ventilation shall be constantly produced in every mine, to dilute and render harmless noxious gases to such an extent that the working places of the shafts, levels, stables, and workings of such mine, and the travelling roads, to and from such working places, shall be in a fit state for working and passing therein.

Inspecting and reporting on Gaseous Mines.

(2.) In every mine in which inflammable gas has been found within the preceding 12 months, then once in every 24 hours if one shift of workmen is employed, and once in every 12 hours if two shifts are employed during any 24 hours, a competent person or competent persons, who shall be appointed for the purpose, shall, before the time for commencing work in any part of the mine, inspect with a safety lamp that part of the mine, and the roadways leading thereto, and shall make a true report of the condition thereof, so far as ventilation is concerned, and a workman shall not go to work in such part until the same and the roadways leading thereto are stated to be safe. Every such report shall be recorded without delay in a book which shall be kept at the mine for the purpose, and shall be signed by the person making the same.

Inspecting and reporting on non-Gaseous Mines.

(3.) In every mine in which inflammable gas has not been found within the preceding twelve months, then once in every 24 hours a competent person or competent persons, who shall be appointed for the purpose, shall, so far as is reasonably practicable, immediately befor time for commencing work in any part of the mine, inspect that part of the mine and the roadways leading thereto, and shall make a true report of the condition thereof so far as ventilation is concerned, and a workman shall not go to work in such part until the same and the roadways leading thereto are stated to be safe. Every report shall be recorded without delay in a book which shall be kept at the mine for the purpose, and shall be signed by the person making the same.

Fencing of Places not in Working.

(4.) All entrances to any place not in actual course of working and extension, shall be properly fenced across the whole width of such entrance, so as to prevent persons inadvertently entering the same.

Stations.

(5.) A station or stations shall be appointed at the entrance to the mine, or to different parts of the mine, as the case may require, and a workman shall not pass beyond any such station until the mine or part of the mine beyond the same has been inspected and stated to be safe.

Withdrawal of Workmen in case of Danger, and inspecting and reporting on Cause.

(6.) If at any time it is found by the person, for the time being, in charge of the mine or any part thereof that by reason of noxious gases prevailing in such mine or such part thereof, or, of any cause whatever, the mine or the said part is dangerous, every workman shall be withdrawn from the mine, or such part thereof as is so found dangerous, and a competent person, who shall be appointed for the purpose, shall inspect the mine or such part thereof as is so found dangerous, and if the danger arises from inflammable gas, shall inspect the same with a locked safety lamp, and in every case shall make a true report of the condition of such mine or part thereof, and a workman shall not, except in so far as is necessary for inquiring into the cause of danger, or for the removal thereof, or for exploration, be re-admitted into the mine, or such part thereof as was so found dangerous, until the same is stated by such report not to be dangerous. Every such report shall be recorded in a book which shall be kept at the mine for the purpose, and shall be signed by the person making the same.

Safety Lamps and Lights.

(7.) In every working approaching any place where there is likely to be an accumulation of explosive gas, no lamp light or other than a locked safety lamp shall be allowed or used, and whenever safety lamps are required by the Act, or by the special rules made in pursuance of the Act, to be used, a competent person who shall be appointed for the purpose shall examine every safety lamp immediately before it is taken into the workings for use, and ascertain it to be secure and securely locked, and in any part of the mine in which safety lamps are so required to be used, they shall not be used until they have been so examined and found secure and securely locked, and shall not without due authority be unlocked, and in the said part of a mine a person shall not, unless he is appointed for the purpose, have in his possession any key or contrivance for opening the lock of any such safety lamp, or any lucifer match or apparatus of any kind for striking a light.

Gunpowder and Blasting.

(8.) Gunpowder or other explosive or inflammable substance shall only be used in the mine underground as follows:—

(*a.*) It shall not be stored in the mine:

(*b.*) It shall not be taken into the mine, except in a case or canister containing not more than four pounds:

(*c.*) A workman shall not have in use at one time in any one place more than one of such cases or canisters:

(*d.*) In charging holes for blasting, an iron or steel pricker shall not be used, and a person shall not have in his possession in the mine underground any iron or steel pricker, and an iron or steel tamping rod or stemmer shall not be used for ramming either the wadding or the first part of the tamping or stemming on the powder:

(*e.*) A charge of powder which has missed fire shall not be unrammed:

(*f.*) It shall not be taken into or be in possession of any person in any mine, except in cartridges, and shall not be used, except in accordance with the following regulations, during three months after any inflammable gas has been found in such mine; namely,

(1.) A competent person who shall be appointed for the purpose shall, immediately before firing the shot, examine the place where it is to be used, and the places contiguous thereto, and shall not allow the shot to be fired unless he finds it safe to do so, and a shot shall not be fired except by or under the direction of a competent person who shall be appointed for the purpose:

(2.) If the said inflammable gas issued so freely that it showed a blue cap on the flame of the safety lamp, it shall only be used—

(*a.*) Either in those cases of stone drifts, stone work, and sinking of shafts, in which the ventilation is so managed that the return air from the place where the powder is used passes into the main return air-course without passing any place in actual course of working; or

(*b.*) When the persons ordinarily employed in the mine are out of the mine, or out of the part of the mine where it is used:

(*g.*) Where a mine is divided into separate panels in such manner that each panel has an independent in-take and return air-way from the main air-course and the main return air-course, the provisions of this rule with respect to gunpowder, or other explosive inflammable substance, shall apply to each such panel in like manner as if it were a separate mine.

Water and Bore-holes.

(9.) Where a place is likely to contain a dangerous accumulation of water, the working approaching such place shall not exceed eight feet in width, and there shall be constantly kept at a sufficient distance, not being less than five yards, in advance, at least one bore-hole near the centre of the working, and sufficient flank bore-holes on each side.

Man-holes on Engine-ways.

(10.) Every underground plane on which persons travel, which is self-acting or worked by an engine, windlass, or gin, shall be provided (if exceeding 30 yards in length) with some proper means of signalling between the stopping places and the ends of the plane, and shall be provided in every case, at intervals of not more than 20 yards, with sufficient man-holes for places of refuge.

Man-holes, or Places for Refuge on Horseways.

(11.) Every road on which persons travel underground, where the load is drawn by a horse or other animal, shall be provided, at intervals of not more than 50 yards, with sufficient man-holes, or with a space for a place of refuge, which place shall be of sufficient length, and of at least three feet in width, between the waggons running on the tram-road and the side of such road.

(12.) Every man-hole and space for a place of refuge shall be constantly kept clear, and no person shall place anything in a man-hole or such space so as to prevent access thereto.

Fencing of Air-shafts and Shafts not in use.

(13.) The top of every shaft which for the time being is out of use, or used only as an air-shaft, shall be securely fenced.

Fencing of Entrances to Shafts.

(14.) The top, and all entrances between the top and bottom, of every working or pumping-shaft shall be properly fenced, but this shall not be taken to forbid the temporary removal of the fence for the purpose of repairs or other operations, if proper precautions are used.

Securing of Shafts.

(15.) Where the natural strata are not safe, every working or pumping-shaft shall be securely cased, lined, or otherwise made secure.

Securing of Roofs and Sides.

(16.) The roof and sides of every travelling road and working place shall be made secure, and a person shall not, unless appointed for the purpose of exploring or repairing, travel or work in any such travelling road or working place which is not so made secure.

Workers' Option to use Down-cast Shaft.

(17.) Where there is a down-cast and furnace shaft, and both such shafts are provided with apparatus in use for raising and lowering persons, every person employed in the mine shall, upon giving reasonable notice, have the option of using the downcast shaft.

Attendance of Engineman to lower and raise Workers.

(18.) In any mine which is usually entered by means of machinery, a competent person of such* age as prescribed by the Act shall be appointed for the purpose of working the machinery which is employed in lowering and raising persons therein, and shall attend for the said purpose during the whole time that any person is below ground in the mine.

---

* A male of not less than 18 years of age.

Signalling and Guides.

(19.) Every working shaft used for the purpose of drawing minerals, or for the lowering or raising of persons shall, if exceeding 50 yards in depth, and not exempted in writing by the inspector of the district, be provided with guides and some proper means of communicating distinct and definite signals from the bottom of the shaft, and from every entrance for the time being in work between the surface and the bottom of the shaft to the surface, and from the surface to the bottom of the shaft, and to every entrance for the time being in work between the surface and the bottom of the shaft.

Cover Overhead.

(20.) A sufficient cover overhead shall be used when lowering or raising persons in every working shaft, except where it is worked by a windlass, or where the person is employed about the pump or some work of repair in the shaft, or where a written exemption is given by the inspector of the district.

Chains.

(21.) A single linked chain shall not be used for lowering or raising persons in any working shaft or plane except for the short coupling chain attached to the cage or load.

Slipping of Rope on Drum.

(22.) There shall be on the drum of every machine used for lowering or raising persons such flanges or horns, and also if the drum is conical, such other appliances as may be sufficient to prevent the rope from slipping.

Break and Indicator.

(23.) There shall be attached to every machine worked by steam, water, or mechanical power, and used for lowering or raising persons, an adequate break, and also a proper indicator (in addition to any mark on the rope) which shows to the person who works the machine the position of the cage or load in the shaft.

Fencing Machinery.

(24.) Every fly-wheel and all exposed and dangerous parts of the machinery used in or about the mine shall be and be kept securely fenced.

Gauges and Safety Valves to Boilers.

(25.) Every steam boiler shall be provided with a proper steam gauge and water gauge, to show respectively the pressure of steam and the height of the water in the boiler, and with a proper safety valve.

Barometer, &c.

(26.) After dangerous gas has been found in any mine, a barometer and thermometer shall be placed above ground in a conspicuous position near the entrance to the mine.

Wilful Damage to Mining Apparatus.

(27.) No person shall wilfully damage, or without proper authority remove or render useless, any fence fencing, casing, lining, guide, means of signalling, signal, cover, chain, flange, horn, break, indicator, steam gauge, water gauge, safety valve, or other appliance or thing provided in any mine in compliance with the Act.

Observance of Directions.

(28.) Every person shall observe such directions with respect to working as may be given to him with a view to comply with the Act or the special rules.

Daily Inspection of the Mine.

(29.) A competent person or competent persons, who shall be appointed for the purpose, shall, once at least in every 24 hours, examine the state of the external parts of the machinery, and the state of the head gear, working places, levels, planes, ropes, chains, and other works of the mine which are in actual use, and once at least in every week shall examine the state of the shafts by which persons ascend or descend, and the guides or conductors therein, and shall make a true report of the result of such examination, and such report shall be recorded in a book to be kept at the mine for that purpose, and shall be signed by the person who made the same.

Inspection of Mine on behalf of Workmen.

(30.) The persons employed in a mine may, from time to time, appoint two of their number to inspect the mine at their own cost, and the persons so appointed shall be allowed, once at least in every month, accompanied, if the owner, agent, or manager of the mine thinks fit, by himself or one or more officers of the mine, to go to every part of the mine, and to inspect the shafts, levels, planes, working places, return air-ways, ventilating apparatus, old workings, and machinery, and shall be afforded by the owner, agent, and manager, and all persons in the mine, every facility for the purpose of such inspection, and shall make a true report of the result of such inspection, and such report shall be recorded in a book to be kept at the mine for the purpose, and shall be signed by the persons who made the same.

Books.

(31.) The books mentioned in the General Rules, or a copy thereof, shall be kept at the office at the mine, and any inspector under the Act, and any person employed in the mine, may, at all reasonable times, inspect and take copies of and extracts from any such books.

DIAGRAMS, &c., used at the INQUEST.

No. 1.—Vertical Section, across Double Stall, near face.

No. 2.—Ditto - ditto - Long Wall, near face.

No. 3.—Long Wall, Method of Working and Ventilation.

No. 4.—Double Stall - ditto - ditto - ditto.

No. 5.—Diagram, showing Long-wall Workings.

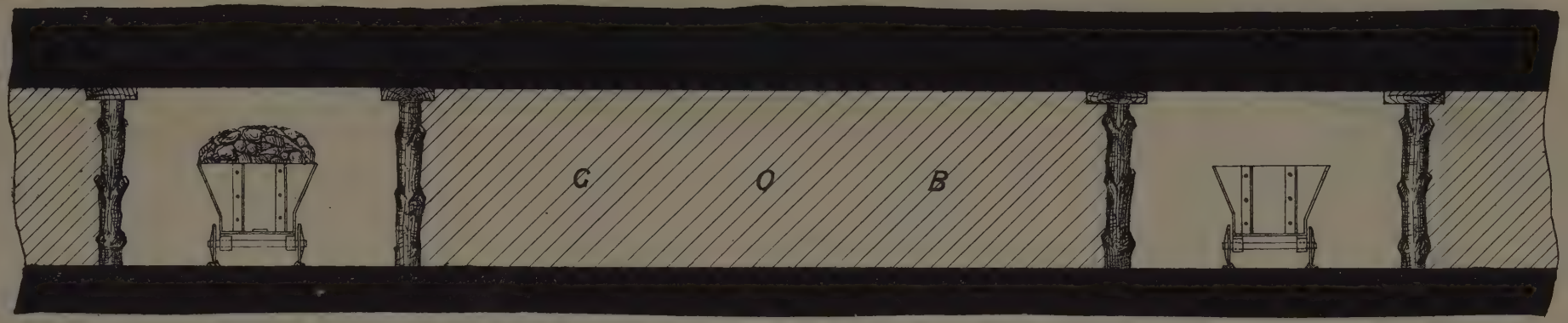
No. 6.—Ditto - showing Double-stall Workings.

[The DIAGRAMS follow.]

VERTICAL SECTION ACROSS DOUBLE STALL NEAR FACE.

Scale 5 feet to an Inch.

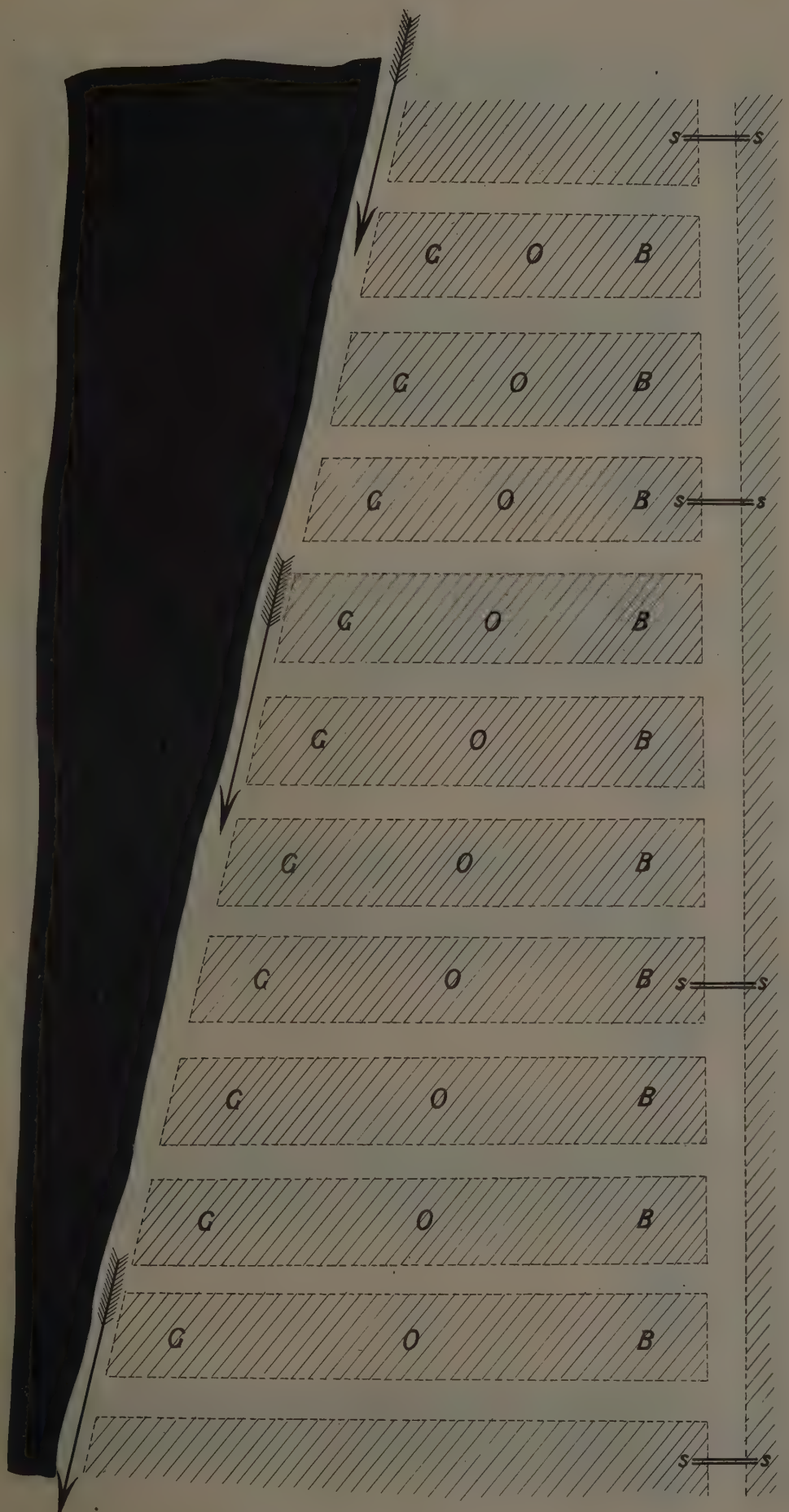
VERTICAL SECTION ACROSS LONG WALL ROADS NEAR FACE.



Scale 5 feet to an Inch.

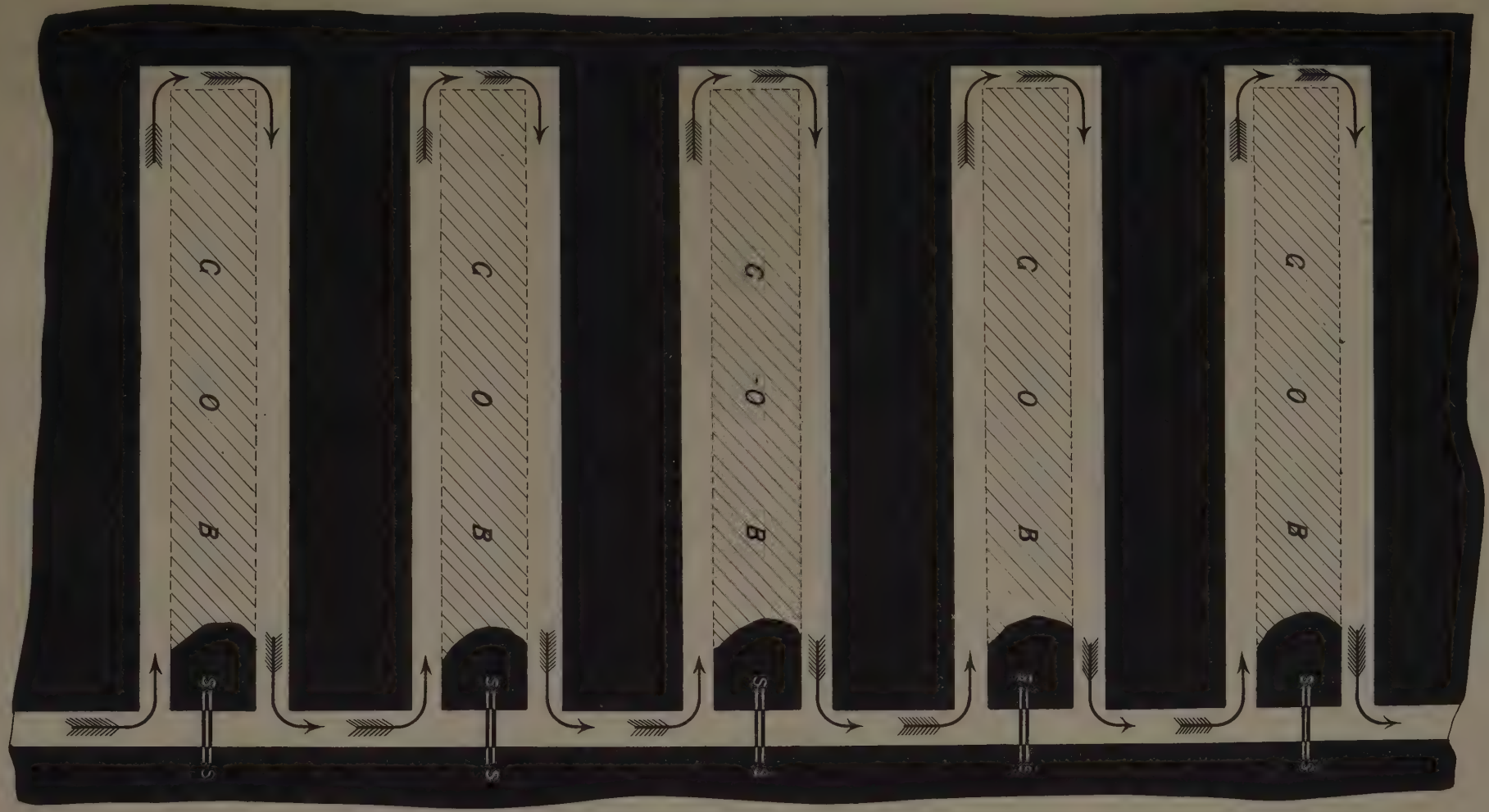
No. 3.

LONG WALL SHEWING METHOD OF WORKING AND VENTILATING.



Scale 40 feet to an Inch.

DOUBLE STALL SHEWING METHOD OF WORKING AND VENTILATING.



Scale 40 feet to an Inch.

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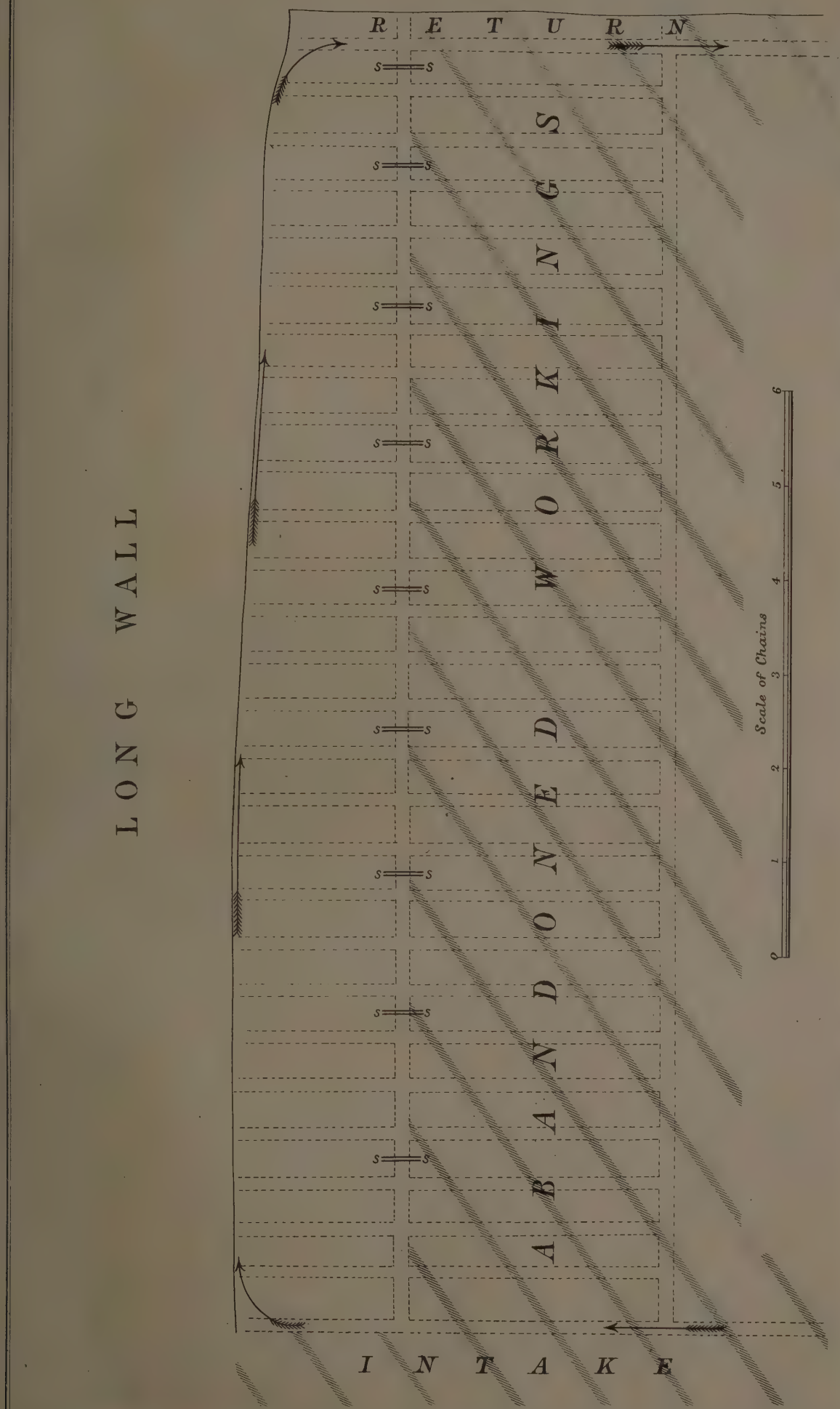
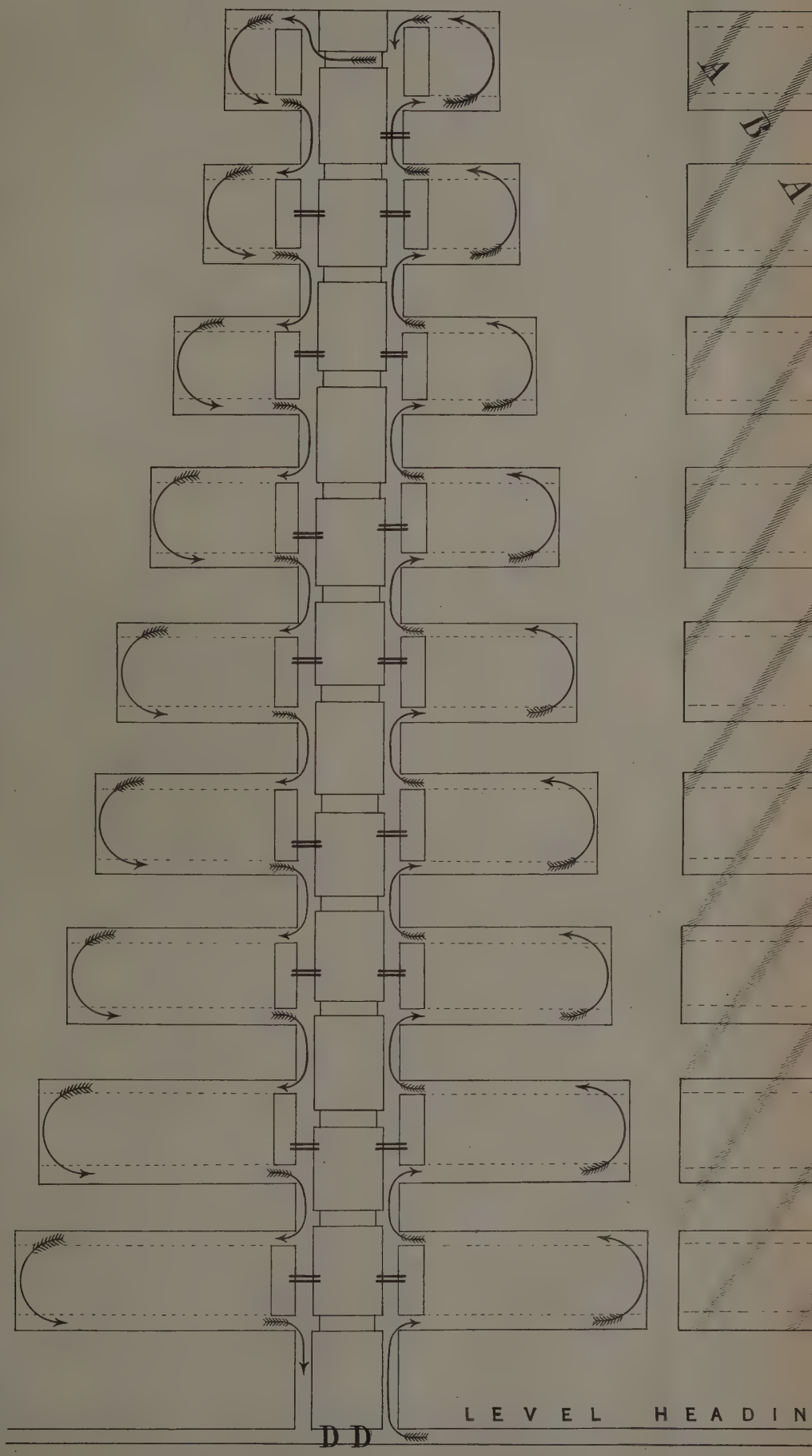

RETURN
LONG WALL
ABANDONED WORKINGS
INTAKE
Scale of Chains
1
2
3
4
5
6

DOUBLE STA



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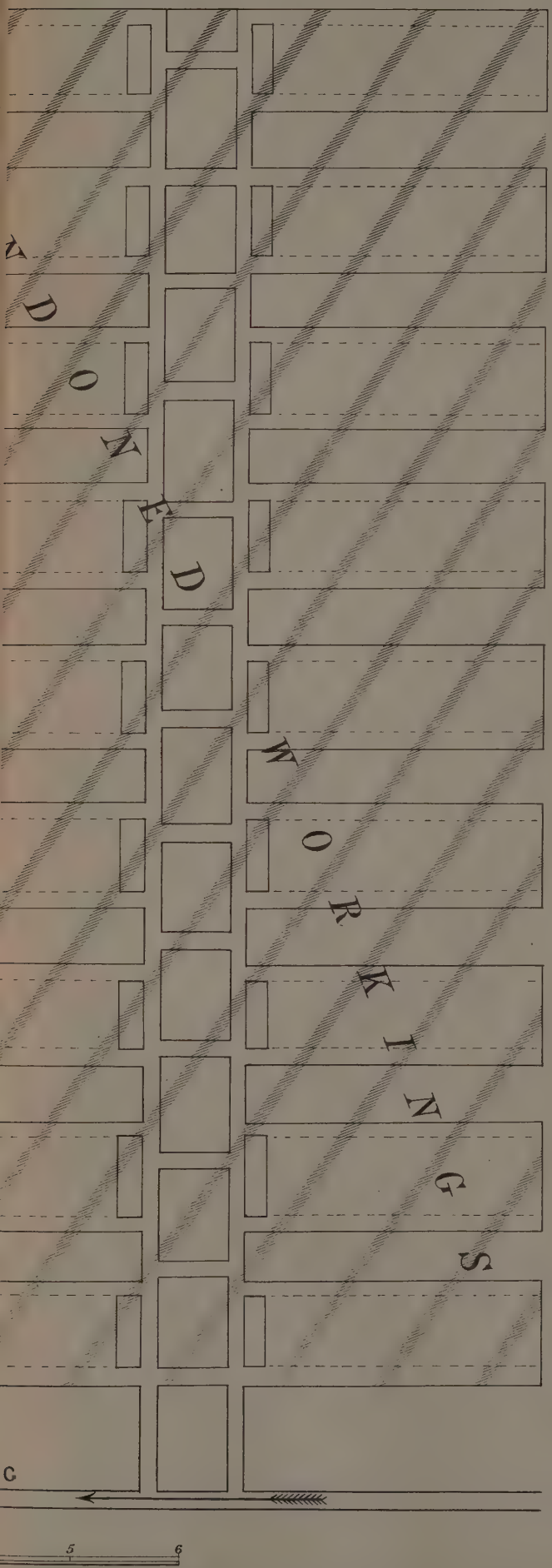

BLANTYRE COLLIERY.

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RETURN to an Address of the Honourable The House of Commons, dated 4 August 1879;—*for*,

"COPY of SPECIAL REPORT to the Secretary of State on the BLANTYRE COLLIERY, dated the 31st day of October 1878, by Messrs. *Joseph Dickinson* and *Ralph Moore*, Inspectors of Mines."

Sir, 31 October 1878.

IN obedience to your directions of the 19th ultimo, we have made further inspection of the Blantyre Colliery, near Hamilton, belonging to Messrs. William Dixon, Limited, relative to the rumoured danger.

On the 5th instant we inspected the report-books, plans, and the results of the recent inspections by Mr. Ralph Moore, and Mr. J. T. Robson the assistant inspector of mines; and on the 7th, 8th, and 9th, the workings in the splint coal, to which the rumoured danger applies; and on the 10th, portions of the main and ell workings which it appeared requisite to see.

The rumour of danger evidently arose from an outburst of fire-damp which is recorded on the 6th of August, in the report-book for No. 3 pit. It seems to have fouled the air so as to make it explosive in the Davy lamp at a distance, as stated, of 154 yards from the point of issue, and to have caused some of the men to make a hasty retreat. In two hours, according to the report-book, it had passed away, and none is said to have been seen since at that place.

The places in the splint coal where we saw indications of fire-damp were:—In No. 2 pit, in Clyde's dook, sufficient to flash in the lamp, and then disappear; and in the lower part of the south workings in the north dook, singing out. In No. 3 pit; at a break in the roof, in a space between pack walls, in the south dook, issuing so as to fire in the lamp. In the north dook, at a break in the roof, a little showing a blue cap on the flame in the lamp; and at the face of the dook, bubbling through water. In No. 4 pit, at the low side, down the dook, bubbling through water, and in the south-west level, in the lower cutting at the face, bubbling through water; also in No. 2 heading, on the rise, at a break in the roof, issuing so as to fire in the lamp; and in the lower level of No. 1 heading, rattling out from the wet floor, showing a blue cap and firing in the lamp; the roof at this part of the mine being on the move, and the work-persons withdrawn.

In the ell coal, at the place where gas had last been found, none remained on our testing.

In the main coal, at the only place where fire-damp appeared to be then known, it was issuing out of a break in the roof so as to fire in the lamp, the work-persons being withdrawn.

The report books show that fire-damp is occasionally met with in other parts of the mines. Also that on the 3rd August last an inspection of Nos. 2 and 3 pits' splint coal workings was made on behalf of the miners, on which occasion is reported:—In No. 2 pit: "all in good order, except a little gas in two places in Speirs's dook;" "the ventilation on the whole first class." In No. 3 pit: "workings and drawing roads in good order, with the exception of the cundy between the level and the branch in the south side of the pit, and a little in two places on the north side of the pit; and as for ventilation we consider it good in all working places and main air course."

In none of the issues of fire-damp which we saw, and in no other, apparently, except that recorded on the 6th August, was the quantity sufficient to show in the return air for more than a few inches from the points of issue.

It is apparent that during the past year important improvements have been made in the colliery. Nearly the whole south part of No. 2 pit has been stopped. Long-wall work is now the principal system of working in all the pits. In the few parts where stoop and room is still practised, driving too far in advance beyond the cut-throughs is being avoided. A second air-way has been made from No. 3 pit. Additional air-crossings have been made, and others are in progress, whereby air-doors have been and are being dispensed with. Air-currents have been shortened, and the amount of air increased to about one-half more than it was. In all parts of the splint and ell coals, except about the pit bottoms, Davy and Clanny safety lamps are now used.

The amount of ventilation now, when all is in order, is such as appears adequate, but to ensure its being constantly produced to dilute and render the gases harmless, the following additional precautions (some of which have been suggested by Mr. Moore in a letter to Messrs. Dixon on the 4th September last,) deserve consideration :—

1st. The working of the main coal, where it apparently causes the air-ways in the splint coal to squeeze and fall, to be stopped, as promised.

2nd. Unnecessary dispersion of the workings to be avoided.

3rd. Air-doors to be maintained so as to fall to of themselves, and check doors to be provided where doors are required between main intake and return air-courses. The strong separation manhole doors between No. 2 and No. 4 pits to be arranged so as not to remain open ; and to be left unlocked in case of a panic.

4th. Stoppings and further air-crossings to be provided, instead of doors, where practicable.

5th. The air-currents to be as short, and the air-courses as large, as practicable.

6th. Return air-currents after passing goaves not to be taken into working places.

7th. The respective return air-currents to be effectually mixed together before reaching the furnace, or to be taken into the up-cast shaft clear of fire and flame, and the fires fed with fresh air.

8th. The use of safety lamps to be continued, and either better light provided for examining lamps in the present under-ground cabins, or to have lamp cabins above ground.

We have ,&c.
(signed) *Joseph Dickinson*,
Pendleton, Manchester.
Ralph Moore, Rutherglen.

The Right Hon.
R. A. Cross, M.P., Secretary of State,
Whitehall.

BLANTYRE COLLIERY.

COPY of Special Report to the Secretary of State on the Blantyre Colliery, dated the 31st day of October 1878, by Messrs. *Joseph Dickinson* and *Ralph Moore*, Inspectors of Mines.

(*Mr. Macdonald.*)

Ordered, by The House of Commons, *to be Printed*
8 *August* 1879.

350.

Under 1 *oz.*

693

DINAS COLLIERY EXPLOSION.

REPORT

OF

Mr. WHEELHOUSE, Q.C.,

ON

THE INQUEST HELD IN THE ABOVE CASE;

WITH

NOTES OF THE EVIDENCE TAKEN AT THE INQUEST.

Presented to both Houses of Parliament by Command of Her Majesty.
July 1879.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1879.

[C.—2370.] *Price* 1*s.* 7*d.*

REPORT.

TO THE RIGHT HONOURABLE THE SECRETARY OF STATE FOR THE HOME DEPARTMENT.

SIR,

1. I HAVE the honour to place in your hands the following Report upon the proceedings arising out of the inquest held at the house of Mr. M. Rees, the Butcher's Arms Inn, at Pennygraig, in the parish of Llantrissant, and county of Glamorgan, on the bodies of John Griffiths and William Jenkins, who lost their lives in an explosion which occurred on the 13th of January last in the Dinâs Colliery, which is also situate in the parish of Llantrissant.

2. The inquest was most ably conducted by Mr. E. Bernard Reece, of Cardiff, one of the county coroners for Glamorganshire.

3. At this inquiry Mr. Simons, solicitor, of Merthyr Tidfil, appeared for the owner of the colliery, Colonel Hunt (who, however, carries on the business under the style of "Coffin & Co."); Mr. William Abraham, of Pentre, Pontypridd, was present on behalf of the friends of the deceased men and the Miners' Association of Wales; and I attended pursuant to instructions forwarded to me from the Treasury on behalf of the Secretary of State for the Home Department.

4. Mr. T. E. Wales, the Government Inspector of the district, and Mr. Rhys, the Assistant Inspector, who has been recently appointed on the resignation of that position by Mr. Galloway, the late Assistant Inspector, were also present throughout the proceedings.

5. Mr. Galloway himself was also in attendance, and it may be desirable, in this place, to mention that Mr. Galloway, after his resignation a few months ago, is understood to have taken office as the consulting engineer of the Dinas Colliery for Colonel Hunt: this however was only subsequent to the explosion.

6. On the first day of the inquest, on which I was not present, all that was done was to identify the bodies of the men, which were brought out of the pit, in order for their burial.

7. Two other bodies having subsequently been found, there was also, I believe, a formal identification of them, for the like purpose.

8. At the moment of the explosion (about 10.30 p.m.) there were, according to the evidence of Samuel Hughes, 63 men and boys in the pit, and of that large number up to this date only four bodies have been recovered, although one man, named William Morgan, who was employed at a pump in the old workings of the No. 3 seam, about 80 yards from the surface, escaping the immediate effects of the blast, was most providentially saved and wound up to "bank."

9. The inquest was practically resumed on Tuesday, the 22nd of April last, at the place above mentioned, and it was continued, from day to day, until Saturday, the 26th of April inclusive.

10. On that evening, all the evidence that was then producible having been exhausted, an adjournment took place until Wednesday, June the 4th, when the inquiry was again resumed, and continued until the afternoon of the following day, when the proceedings were brought to a close, the jury finding the following verdict:—

"That the deaths of John Griffiths and William Jenkins occurred through an "explosion of gas at the Dinas Colliery, and

"That the origin of that explosion was accidental, and the jury believes, from "the evidence adduced, that it occurred through a sudden outburst of gas in or "near Morris's heading.

"At the same time the jury strongly censures the course adopted by the colliery "authorities in placing John Chubb nominally as overman, but really as part "manager, after his certificate was suspended through his incompetency in con-"ducting the management of the said colliery."

11. To this finding, although I have here inserted it for convenience, I shall have occasion hereafter more fully to recur, for the purposes of this Report.

12. The village of Dinas is situate about 20 miles from Cardiff up the Rhondda branch of the Taaf Valley, and the communication between it and Cardiff is direct by railway:

Pennygraig, the nearest available place where the inquest could be held, being about two miles still higher up the Rhondda Valley than the colliery at Dinas, which is close by the Pandy Railway Station.

13. The population of the village of Dinas, in common with that of most, if not all, of the other villages in the district, is nearly wholly composed of coal-miners and their families, or of persons employed in one position or another in connexion with the various collieries in the neighbourhood.

14. The coal which is now being won at this mine is that which is commonly known as steam coal, and it is but too well understood-that not only is it in itself very explosive, but this colliery, in common with most others of a similar character, would, I apprehend, be classified and considered as being a very fiery one; a fact, indeed, conclusively proved by the evidence adduced on this inquiry.

15. The lamps in use were partly "Clanny" and partly "Davy" lamps, though no evidence of a reliable character could be obtained as to the proportion or numbers of each kind actually in the hands of the workmen at the time of the explosion.

16. According to the testimony given, the use of naked lights was strictly prohibited throughout the pit, except at the three lamp stations, and at the bottom of the shaft, which was stated to be, at least, some 300 or 400 yards distant from the nearest working places in which any of the men were employed.

17. At the time of the explosion, the plan of working was that known as "the double shift," and the system of operation was that of "the long wall."

18. The ventilation of the mine was carried on by means of a large "Waddle" fan 40 feet in diameter, and the air passing down was, according to all the evidence, amply sufficient, if properly and judiciously distributed, being at first on the average about 68,400 cubic feet per minute, which by some improvements made very recently before the explosion was increased to 72,750 cubic feet per minute, as taken by the anemometer on the 20th of December 1878.

19. All the plant, going gear, machinery, and appliances generally, appear to have been in good working order.

20. The practice of shot firing was in use in this as in many other of the collieries (it was stated) throughout this district.

21. The works comprise two separate shafts known respectively as the "Lower Pit" and the "Middle Pit," about 240 yards from each other, the Lower Pit being the downcast. This downcast is a circular shaft of about ten feet in diameter, sunk some years back down to the four feet or "Polka" seam, the depth of which is about 330 (329 exact) yards from the surface. This shaft also passed through what was known as the "two feet nine" seam, at a depth of 307 yards from the top, and at that point there is a coal landing for that seam.

22. The other or "Middle Pit" is the upcast, and is in shape an oval 15 feet by 12, and is rather more than 400 (407 exact) yards deep, going down to what is known as the "six feet" seam, and it is from this point that coal was being landed at the time of the calamity.

23. This shaft passed through the four feet seam mentioned above, and when it did so, namely, at 329 feet below ground, there was an opening into the four feet, but this opening, as I understood, had not any landing, neither was there any opening then in use into the "two feet nine" seam, though the shaft of this Middle Pit struck directly through that seam also.

24. The air current, as it passed, on entry, down the Lower Pit was split, one portion going through an opening into the "two feet nine" seam, and the other through the "four feet." These two currents, after ventilating the workings of both these seams, came together, and again forming one single current passed down a place known as "the staple pit" 78 yards deep from the "four feet" to the "six feet" seam where the works were then being carried on.

25. A glance at the smaller of the two plans appended hereto and marked **A** 1 shows very clearly the method by which the current of air went down the Lower Pit shaft, being split between the headings in the two feet nine and the four feet seams, going once more in the "heading at the rider" into the four feet, descending the Polka Pit, and thus being carried into the six feet seam.

26. Upon entering this, the six feet seam, the current was carried round the workings so as to ventilate them in the manner shown by the arrows drawn on the larger plan appended hereto, and marked **A** 2, and as are described by Mr. C. H. James (p. 1, transcript of notes) and other witnessess.

27. Having traversed the workings as I have mentioned, the air returned up the shaft of the Middle Pit (the upcast that is) to the fan.

28. There seem to have been no less than four separate inspections made on the part of the Government by the then Assistant Inspector of the district, Mr. Galloway, between the 13th of April 1878 and the 6th of August in that year.

29. Inspections were also made of the six feet workings on the 27th of April, as well as on the 13th of that month, and the colliery was then reported as all safe.

30. Another inspection took place, as I understand, either by Mr. Wales's direction, or in the discharge of his own ordinary duty, by Mr. Galloway on the 13th of June 1878, and this inspection resulted in the discovery of gas in both the "two feet nine" and the "four feet" workings, which gave rise to the institution of proceedings against the then manager, John Chubb; and to this matter it will also be my duty to recur again hereafter.

31. At the inspection made on the 6th of August 1878, an accumulatiou of gas was found in Coleman's heading, situate nearly on the extreme south of the workings in the "six feet" seam.

32. This led to a correspondence between the Inspector (Mr. Wales) and the consulting engineer of the colliery (Mr. G. H. James), with a view to reduce the temperature, which in some places was as high as 75° or 76° Fahrenheit, as well as to the clearance of the gas.

33. This clearance was said to have not only been effected, but in consequence of the steps which were then taken, the quantity of air passing through the works seems to have been much enlarged.

34. In reference to this matter, I think it right to direct attention to a few words in Mr. Wales's evidence, where he says "that it is but fair to state that the high temperature "was due more to the great depth of covering above the workings, they being 1,700 or "1,800 feet below the surface, than to the scarcity of air travelling through them."

35. I was happy to find that the 30th General Rule made under the provisions of the Mines Regulation Act, 1872, was duly carried into operation, as there was a periodical examination by two workmen delegated by a committee of themselves for the examination of the pit, and after finishing each monthly inspection, the result of it was not merely entered in a book kept at the office of the colliery for that especial purpose, but, having been copied, was placed either upon or close to the office door, so that it might be seen by any one who felt any interest in it.

36. The discipline of the pit, so far as it affected the workmen, seems to have been well maintained, but, when stating this, I am very anxious to be thoroughly understood as confining this observation strictly to those engaged either in cutting coal, or, at all events, to the minor "officialism" of the pit, and my motive for such anxiety will, I think, be sufficiently apparent hereafter.

37. Subsequently to the date above mentioned, there does not seem to have been any further record of accumulated gas until the 11th of December, about a month, that is, previous to the explosion.

38. The presence of this gas was reported in the daily report book, till the 26th or 28th of December, when, in consequence of directions given by Mr. James, the gas was or was supposed to have been cleared off, the mine again rendered safe, and the workmen who had been directed to leave that particular locality, namely, a place known as John Morris's heading, or (as it is marked on the plan) Cross Measures Drift, were sent back to their stalls on that heading, or some of them were so.

39. I think it just and right to say that all the books, papers, records, &c. &c. of the mine and the establishment generally, appeared to me to have been almost unusually well kept.

40. I come now to that which was to me a very painful part of this inquiry:—

41. As I have previously mentioned, the owner of the mine was Colonel Hunt (E. D. Hunt), a gentleman whose address is 3, Onslow Gardens, South Kensington, and who made periodical visits to the property, and seems to have taken some, though, possibly, only a slight, part in the direction of the affairs of this colliery personally.

42. At the time of the explosion, Mr. George Henry James, a mining engineer carrying on business at Merthyr Tidfil, some 15 or 20 miles away, was the consulting engineer or consulting agent of the colliery, though I understand he has since ceased to be so, having been replaced in that office by Mr. Galloway, who had previously been the Assistant Inspector (under Mr. Wales) of that district.

43. A young man, named *Samuel Hughes* of the age of 26, who had formerly been an overman in the same colliery, was, at the date of the occurrence, in office, and acting as temporary manager, under the provisions of subsection (b) of clause 26 of the Coal Mines Regulation Act, 1872, the person who had preceded him in that position being a man many years older than Hughes, named John Chubb.

44. It may, perhaps, be well, for facility of reference, that I should here quote the provisions of subsection (b) clause 26 of the above-named Act:—

"The owner or agent of such mine may appoint any competent person not "holding a certificate under this Act to be manager for a period not exceeding "two months, or such longer period as may elapse before such person has an "opportunity of obtaining, by examination, a certificate under this Act, and shall "send to the Inspector of the district a written notice of the name and address of "such manager, and of the reason of his appointment."

45. This temporary appointment of Hughes was made in consequence of the suspension of John Chubb's certificate, as such manager, for six months from the 19th of November last, on a sentence pronounced by Mr. Rothery, the Wreck Commissioner, assisted by Mr. Cadman, an Inspector of Mines (who acted as Mr. Rothery's Assessor in the investigation), under the 32nd section of the Coal Mines Regulation Act, 1872, for the negligent performance of his duty in the management of this very mine, and it is desirable that I should quote a few words from the evidence given by Mr. Wales on that inquiry, as also from Mr. Rothery's observations previous to passing sentence. Mr. Wales says, "I have heard the evidence of Mr. Galloway, and assuming his facts to be "correct I consider that there would have been no difficulty in removing the gas. In "such a state of things it was very dangerous for men to be at work. I have never "known men permitted to work where there was such a large accumulation of gas, and "I do not think they should have been allowed to do so in this case. Considering the "surrounding circumstances the accumulation of gas must, in my opinion, have been of "long standing, and during the time the opening between the heading and the six-feet "seam was being made, there would not have been any difficulty in keeping the heading "clear of gas." And Mr. Rothery, in finding the charge proved, when he passed sentence added, * * "There is no refutation of the statement that if an explosion "had taken place in the state in which the mine was found by the Inspector, not only "would there probably have been a great destruction of property, but also the loss of "many lives. Therefore the Court cannot but conclude that Mr. Chubb has been "guilty of a very serious offence. According to the evidence of the two Inspectors, "the mine must have been in an unsafe state for some time, and Mr. Chubb must have "been aware of it, and as he has failed to see that a proper record of it was made by his "subordinate he has undoubtedly violated the second rule also. As to the third charge, "the fact that the overman had neglected his duty by not removing the men from the "dangerous workings was no excuse for Mr. Chubb neglecting his duty, and the "Court, finding him guilty of each of the three charges, must order a suspension of his "certificate for six months, the lightest possible punishment being inflicted in con-"sideration of his good character."

46. I have quoted these two expressions of opinion, which I find recorded at pp. 238 and 239 of the Annual Report of Her Majesty's Inspectors of Mines for 1878, just published, on account of the strong significance with which they tell upon the circumstances surrounding this inquest.

47. That there was, no doubt, some practical difficulty in immediately filling the place rendered vacant by the suspension of John Chubb's certificate is clear, and as the statement was more than once made at the inquest, it is but right to assume that "Messrs. Coffin & Co." were looking out for a new certificated manager when the calamity happened.

48. Moreover, there cannot be any question that the proprietor was acting within his strict rights accorded under the 26th section of the statute, literally speaking, in exercising the power of appointing a non-certificated temporary manager, under the circumstances in which the colliery was placed.

49. In proof of this, I think it well to insert here copies of the following correspondence which passed between Messrs. Coffin and Company and Mr. Wales:—

No. 1.—Messrs. COFFIN & Co., Dinas Collieries, Pontypridd, to the INSPECTOR OF MINES, Swansea.

DEAR SIR, Cardiff, November 20, 1878.

THE result of yesterday's inquiry into the conduct of our manager, Mr. Chubb, has placed us in a difficulty, as to which we trust we shall be in order in troubling you. We were naturally anxious not to prejudice Mr. Chubb's case by making any change in the management before completion of the inquiry, but we are now taking every possible step to procure a new manager, and will immediately advise you when we have been able to procure a suitable man. In the meantime, we have no suitable person at the colliery whom we can nominate for the temporary vacancy, and we have to ask you whether, under the peculiar circumstances of the case, we should be warranted in leaving Mr. Chubb in charge until another manager has been appointed. The only alter-

native to this course appears to us to be the appointment of a far less competent person than is Mr. Chubb.

We hope you will excuse us if there is any impropriety in our saying, further, that we should esteem it a favour if you would name any certificated managers who are in want of employment, and would be likely to suit our requirements.

We are, &c.
COFFIN & Co.
(Signed) L. WOOD.

Thos. E. Wales, Esq., Swansea.

No. 2.—The INSPECTOR OF MINES, Swansea, to Messrs. COFFIN & Co.

DEAR SIRS, Swansea, November 22, 1878.

IN reply to your letter of the 20th instant, I think the matter to which you refer is one on which your solicitor will be better able to advise you than I am. I do not know of any suitable person to fill the vacancy, but think you will not have much difficulty in these times in finding one.

I am, &c.
(Signed) THOS. E. WALES.

Messrs. Coffin & Co., Dinas Collieries, Pontypridd.

No. 3.—Messrs. COFFIN & Co. to the INSPECTOR OF MINES, Swansea.

Cardiff.

WE duly received your favour on the subject of the appointment of an interim manager for these collieries. Acting thereupon, we have consulted our solicitor, who advises us not to appoint Mr. Chubb, even temporarily, and we have accordingly appointed one of our overmen, Samuel Hughes, to act until we have been able to obtain a certificated manager, which kindly note.

We are, of course, sparing no effort to secure a permanent manager speedily, but we may add that we believe Hughes, who will try for a certificate at the next examination, is quite competent to fulfil the requirements of the post.

We should be much obliged if you would own receipt of this letter to our Cardiff office.

Yours, &c.
COFFIN & Co.
(Signed) L. WOOD.

T. E. Wales, Esq., Her Majesty's Inspector of Mines, Swansea.

No. 4.—The INSPECTOR OF MINES, Swansea, to Messrs. COFFIN & Co.

DEAR SIRS, Swansea, November 27, 1878.

I BEG to acknowledge the receipt of yesterday, informing me that you have appointed Mr. Samuel Hughes to be the manager of your Dinas Collieries, in accordance with sub-section (*b.*), section 26, Coal Mines Regulation Act, 1872.

Yours, &c.
(Signed) THOS. E. WALES.

Messrs. Coffin & Co., Dinas Collieries.

50. When, however, Samuel Hughes having been thus appointed as such temporary manager, and John Chubb's certificate so suspended, the owner and his advisers thought (as some of them apparently seem to have done, though their solicitors advised them "not to appoint Mr. Chubb even temporarily,") everything that duty required of them was efficiently fulfilled by a simple change in the relative positions previously occupied by Hughes and Chubb, especially when we are informed, as Hughes in his testimony tells us, that, on receiving his appointment, Mr. James and Mr. Wood told him particularly what his duties were to be, Mr. James saying that he was "to be responsible for the "safety of the mine according to the Act," and Mr. Wood adding "that as Chubb was "an older man than me (Hughes) I ought not to do anything without asking his "advice," and when we find that from the very first moment when this arrangement was completed, Chubb was virtually and practically, as was abundantly proved by the evidence, acting very much as he pleased, often with little, perhaps not any, reference to the new manager, and at all events going and coming pretty much where, when, and as he chose, the view as to the position relatively occupied by each of the two men, expressed by the jury, will be very generally indorsed, and there cannot be the slightest hesitation in saying that such a state of matters is one that must be regarded with the very gravest possible regret.

51. In the view taken in reference to this subject by Mr. Wales in his evidence at the inquest, I have only to express my own full concurrence.

52. While very carefully avoiding anything like inducement to take part in local views or partizan differences, I must not, however, omit to call attention to the letter and evidence, called for by the jury, of Mr. Morgan Rowlands, a former manager of the Dinas Colliery :

53. It appears that John Chubb immediately succeeded Rowlands as manager, in consequence, as the latter states, of his declining to remain any longer in his then position if Chubb was allowed to continue as overman, he (Rowlands) coming to that decision (as he alleges) because the colliery was rendered positively unsafe by Chubb's want of care in the performance of his duty, partly as to the accumulation of gas needlessly permitted to exist, and partly in reference to his (Chubb's) insubordinate conduct towards himself (Rowlands) as manager.

54. An investigation by the owner, in conjunction with Mr. James and Mr. Wood, his coal agent, of one of these charges, resulted in Rowlands leaving the service, apparently because his allegations were either wholly discredited or were thought to have been exaggerations, and, as I have stated, on Rowlands leaving, Chubb was appointed to succeed him.

55. This led (admittedly, at any rate, so far as Morgan Rowlands himself was concerned) to an angry feeling on his part, a feeling which seems to have been increased and culminated in the letter from him to Colonel Hunt, which Colonel Hunt's legal advisers thought it right to bring before the coroner and jury, and which will be found on my transcript of notes (p. 76). In this letter Rowlands virtually says that he had foreseen and, as I understand, foretold that the consequence of such defective management could only end in some such dreadful calamity as ultimately happened.

56. Without at all entering into the merits or demerits of this controversy, it becomes of importance to call attention to both the letter and Rowlands' evidence in regard to it, which stand, up to this moment, wholly uncontradicted; and if we are to accept it as true, or even partially true, it must add greatly to the feeling of regret that the warning (if really given) was allowed to pass by nearly, if not entirely, unheeded.

57. Neither can I leave unnoticed the fact that there seems reason to believe that for nearly the whole of the last month prior to the explosion, Mr. James, the consulting engineer, had not been down into this part of the pit, since ordering the insertion of an additional pipe for the purpose of dispersing an accumulation of gas, to which his attention was at that time (namely, in December) called.

58. It is only just both to Samuel Hughes the manager, as well as to John Ace, and the other firemen who were examined, to say that they gave their testimony apparently with great truthfulness, whether it told for or against them, while on the other hand, the evidence given by Chubb was most unsatisfactory both as to matter and manner, his immediate purpose being to remove any responsibilty he might have had from his own shoulders to those of other people.

59. John Chubb (as will be seen from the transcript of my notes) was examined on the first day of the adjourned inquest (the 22nd of April), that is, before the second adjournment, and when the jury re-assembled it was stated that he had left his home, and indeed this country, under most discreditable circumstances.

60. There is but too much reason to fear that the reversal of positions carried into effect by the owner, as between Chubb and Hughes, would necessarily, especially with the orders, or directions rather, given to the latter when his new office was conferred, tend to impress him with the idea that he was, however erroneously, to consider Chubb, who might, on the expiration of the six months for anything he (Hughes) knew, be reinstated in his former place as manager, as his equal or even superior officer, a view somewhat confirmed by Hughes' own expression that he "Was to be responsible for the "safety of the mine, and Chubb was to be in charge of the expenses."

61. With all respect for the jury I cannot agree with that part of their verdict which speaks of a sudden outburst of gas, the whole body of testimony proving, I think, most convincingly, that this explosion was attributable to an accumulation, as distinguished from any sudden outburst of gas, in Morris' heading, which was not only preventible to a large extent, if not wholly, but which was not sufficiently controlled or dealt with by those in charge of the mine.

62. While thus venturing, however, to differ with the jury, I must say, in justice to every member of it, that they attended to all the proceedings most closely and carefully during the whole of this inquiry.

63. I doubt whether the "Clanny" lamps, from their construction, can be used with so much safety in a fiery mine like this as the older "Davy," since the latter, while it

does not nor ever can afford so much light as the other, yet it has the advantage of presenting a much less surface, and being wholly made of wire gauze and iron, is not so much liable to fracture by accident.

64. It is most desirable (if it were possible) to prohibit, except for the sole purpose of transmitting light to the workmen's lamps, the use of all open lights, whether at the bottom of the shaft or in the lamp stations, as they are called, in mines such as the Dinas Colliery.

65. Shot-firing also is so manifestly dangerous in such workings, as to call loudly for its absolute prohibition, if by any means the operation can be dispensed with.

66. Although, not being an engineer, I speak with some diffidence, yet I must confess that I think the "long wall" system is, to say the least of it, not so safe, especially in mines like this, where there are much "soft" or "neish" coal, some faults, and many "blowers," as the older method of "pillar and stall" working, all the rather when we remember that the opening by long wall must, in all probability, present, from its very character, so much larger unsupported space, when the working of the coal in any given heading or stall is becoming nearly exhausted.

67. Resort should never, in my judgment, be had, where it is possible to avoid it, to the plan of carrying air for ventilating purposes through pipes or tubes, as was the case in this instance, since while such tubes can scarcely ever be adequate to the purpose intended, they not only confine the space, but leave room behind them for the accumulation of a large body of gas.

68. I am of opinion that under the 63rd clause, subs 1., of the Coal Mines Regulation Act, 1872, the time had elapsed, even before the first bodies were discovered and brought up from the mine, within which any summary proceedings could successfully have been initiated against any one in connexion with this very lamentable occurrence.

69. Had it not been for the express finding of the coroner's jury that the explosion was accidental, I should certainly have thought that Samuel Hughes (the manager), John Chubb, and perhaps John Ace (the fireman) had respectively been guilty of such negligence as would have rendered them liable to an indictment for manslaughter, but, after the verdict so found, I fear that there would be much less probability of a conviction for that offence being obtained; although, no doubt, a prosecution for it might be brought, though it is by no means so easy to say "maintained," if by maintenance a conviction is to be looked for as a matter of certainty. Whilst, however, I say this, it might be well to consider whether (for the sake of example), it may not be desirable to institute such proceedings without reference to the result, although I am bound to add that I, generally speaking, deprecate anything like abortive proceedings as usually doing more harm than good.

70. Beyond this, if any indictment were preferred, it admits of some doubt whether Mr. G. H. James, the consulting engineer or consulting agent of this colliery, ought not to be included in any such proceedings, seeing that it is almost absolutely certain, indeed admitted, that he never entered that part of the mine from the time he gave the order for placing the last pipe in its position till the occurrence of the explosion, that is, very nearly a month, though even, with regard to Mr. James and his duties, it is well to bear in mind, that there does not appear to have been any stated time within which he was to make any periodical visit of supervision; nor that, in the meantime, any communication had been made to him, calling especially for his attendance or attention at the colliery.

71. Nevertheless I think any act done either by the owner or by Mr. James would be so "remote" as, legally speaking, to render an indictment against him for manslaughter abortive.

72. I look upon the act by which John Chubb was virtually placed by the owner, Mr. James, and Mr. Wood, as manager or "part manager" of the mine, notwithstanding the suspension of his certificate, and notwithstanding also the nominal appointment of Hughes, as an evasion of the spirit of the statute, but I doubted, and I confess I still doubt, whether a court or jury might not be induced, under the strict interpretation always placed upon the language of a "penal" Act of Parliament, to consider that what was done was not (again legally speaking) an offence within the letter of it.

73. There would have been no difficulty as to this course, at least under clause 61, had it not been for the restriction laid down in the clause I have previously quoted (namely, clause 63, subs. 1), but I fear any proceedings under the 61st clause were actually legally barred by lapse of time, even before the discovery of the body first brought out of the pit.

74. On the whole, therefore, disastrous as the calamity has been, looking at both the evidence and the finding of the jury, as well as going very carefully through every section of the Mines Regulation Act, 1872, and bringing to bear my own view (as a lawyer) of the enactments as to manslaughter in reference to this case, I do not think any criminal or penal proceedings would result in a verdict against the accused; in other words, I think they would possibly, indeed probably, fail in that respect (although, as I have said, they might be useful on account of the example).

75. Still I hope I am not wrong, or in any way exceeding my province or my duty, in suggesting that it might be desirable to obtain, if possible, the opinion of the law officers of the Crown in reference to the matter.

76. When forwarding this Report together with the plans appended hereto, and the transcript of my notes, I cannot conclude without calling attention, not only to the evidence given by Mr. Wales, but also referring to the most valuable assistance he rendered to me and to the jury throughout the whole of this very painful investigation.

I have the honour to be,

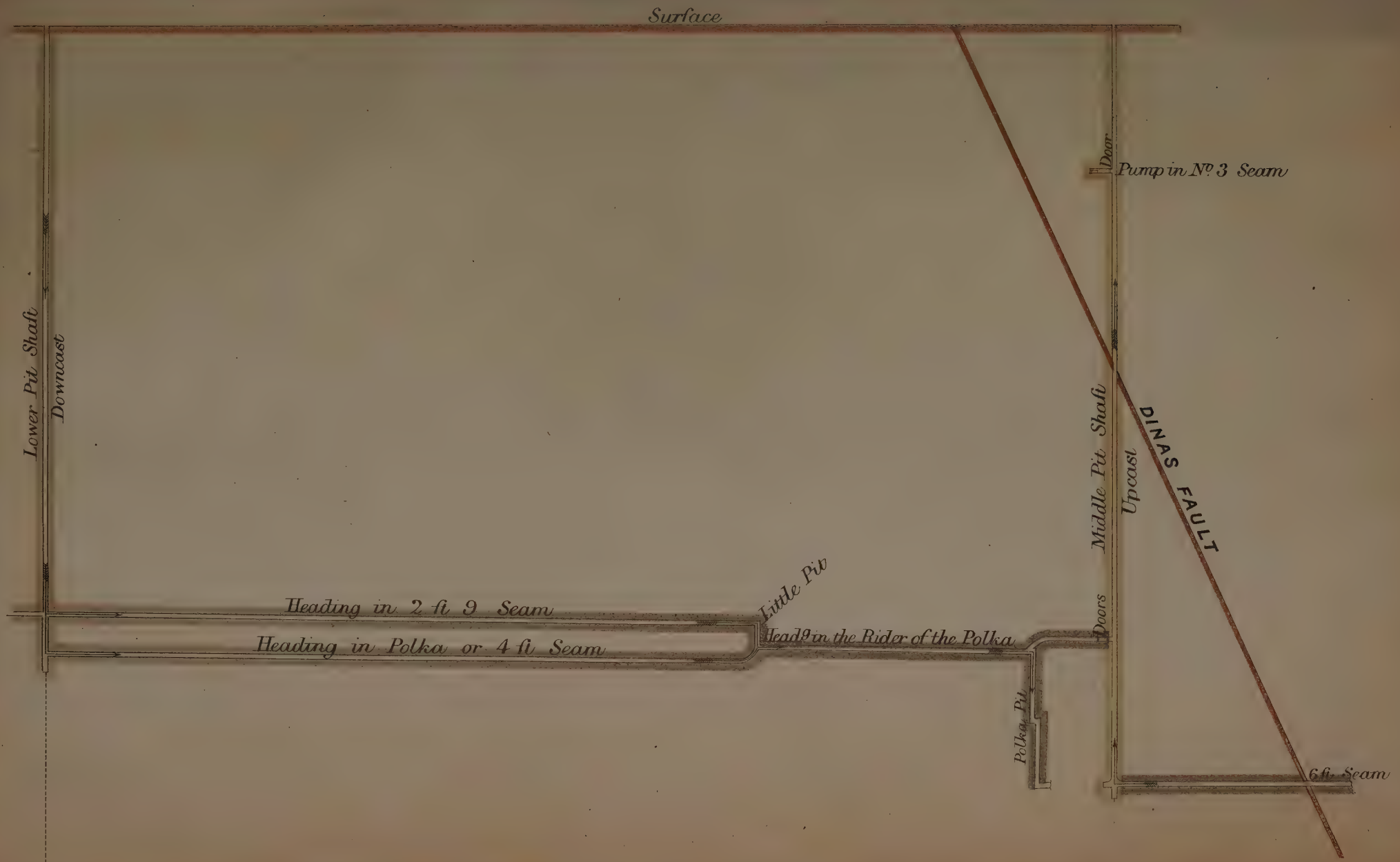
Sir,

Yours very faithfully,

(Signed) W. ST. JAMES WHEELHOUSE.

2, Crown Office Row,
The Temple,
June 13th, 1879.

DINAS COLLIERY.



Datum line 1000 feet below that of the Ord Survey.

Scale 3 Chains to an Inch

NORTH DISTRICT

THROUCH FAULT DISTRICT

FAULT

RETURN HEADING
MAIN LEVEL HEADING

LAMP STATION

DAVIES' HEADING
GEORGE MITCHELS HEADING

TOM BOAT'S HEADING

DAN MORLEY'S HEADING

LABORERS HEADING

PARTRIDGES HEADING

CONSTANTINOPLE

LAMP STATION

JAMES SIMONS
JOHN CHARLES

CALIFORNIA HEADING

JOHN GIBBON

JOHN MILLER

COLMANS HEADING

JAMES LOT

DAVID LEWIS HEADING

DINAS FAULT

LAMP STATION

Middle Pit (Upcast)

Pitha Pit (Underground)

Pitha Little Pit (Underground)

Headway on Two Feet Nine Seam

Lower Pit (Downcast)

Scale. 4 Chains to an Inch

DINAS COLLIERY EXPLOSION.

Before E. BERNARD REECE, Esq., Coroner.

Adjourned Inquest on the Body of John Griffiths (Hitcher).

Accident occurred about 10.30 *p.m. on the* 13*th of January* 1879.

TRANSCRIPT OF NOTES.

Wm. St. J. Wheelhouse.

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22. William Richards, collier	27
23. David Powell, collier	28
John Ace (recalled), fireman	28
24. William Price, superintendent or sergeant of police	28
Samuel Hughes (recalled), manager	29
25. Mr. T. E. Wales, Inspector of Mines	30

Tuesday, 22nd April 1879.

Nineteen jurymen summoned, of whom the following were present to-day, namely :—

David Jones (Foreman), David Davis, William Williams, David W. Davis, Thomas Nornton, Richard J. George, Richard F. Richards, Edward Jenkins, Thomas Richards, Edward Meredith, Thomas Williams, Richard L. Smith, William Howells, William Rees, Rev. J. R. Jones, Howell Llewellyn, Hopkin Knill, Richard Cook.

Jabez Matthews (Superintendent of Police, Pontypridd), and William Price, Sergeant of the same force, were in attendance at the inquest.

George Henry James sworn ; examined by Coroner.

G. H. James.

22 April 1879.

I am a mining engineer at Merthyr Tydfil. I have acted as consulting engineer for the colliery at Dinas, from November 1877 until the middle of March last. The colliery belongs to Colonel Hunt, trading under the name of Coffin and Company. The colliery is in the parish of Llantrissant, Glamorganshire, in which all the pits are. John Chubb was the manager when I first came, then, after December last, he was superseded by Samuel Hughes, who was appointed in his place. Chubb had had his certificate suspended for six months, on an inquiry which was held at Cardiff. Hughes was only temporarily appointed under subsection *b* of the 26th section of the Mines Regulation Act, under which he had been authorised to act. Added to this, he had received an authorisation by the Secretary of State to appear for examination, but he did not appear in consequence of this accident, which, occurring as it did, only a week before it, he felt that it was useless to proceed at that time with the application. When Chubb was suspended, he was not discharged wholly, but was acting as overman at the Middle Pit at Dinas, under Samuel Hughes. The general belief is that the explosion took place in the 6 feet seam. There are really two working pits. There are two shafts, one called No. 1, on the plan produced, the other called the Middle Pit, No. 2. Both these pits wound coal. The Middle Pit was the upcast, the Lower the downcast. There was a fan at the Middle Pit, No. 2, then the air rushed down No. 1, Lower Pit. The air first went down the Lower Pit, till

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it came to the 2 feet 9 seam. That was where the coal was put into the cage. A split of air went into the 2 feet 9 workings, ventilated those workings, and then went down an air-pit about 22 yards deep, which had been sunk from the 2 feet 9 to the 4 foot. At the bottom of this little pit the air was joined by the air which comes from the other, making one column; thus the whole body of air passed from the little pit to the rider of the Polka or 4 feet seam; then it goes down the Polka pit about 70 or 80 yards in depth, roughly speaking; from that point it passes through hard ground for about 100 yards, passes through the Dinas fault, and enters the 6 feet seam of coal. Then it passes in for 60 or 70 yards, but about 40 yards a small "split" is taken off from the intake for the ventilation of a cross-measure heading for the purpose of ventilating the Polka (or 4 feet) seam. The main portion of the air continues on over an air-bridge for 60 or 70 yards, where it is again split at the point now marked No. 3 on the plan (No. 2*a* marks the little split for ventilating the cross-measure). This goes to David Lewis's heading, southwards. This may not be quite so much as 60 or 70 yards, it may possibly be no more than 40 or 50 yards. Then the main portion of the air continues in a westerly direction under another air-bridge marked ✕ on the plan, past the stables, and on to a point marked 4 on the plan; it is there split again, one portion going south, the other west. The part going west continues in a westerly direction, going along the main level heading as shown on the plan. This heading is driven 13 yards up to the west, where the same 6 feet seam is again won on that, the west side of the fault. The air then proceeds along the main level, and to the point marked 5 on the plan. It then goes south along George Mitchell's heading to the face of that heading, a portion being turned in to the eastern side to ventilate the portion on that side, and then it travels along the western face northwards, back to the return heading, which runs parallel to the main heading already described. It travels along this return heading to a point near the stables, and thence along this return heading to the Middle Pit (the upcast). Here we have done with this air. Going back to the point No. 4, a split of air starts along the "labourers' heading," and travels 200 yards south to the point marked 6 on the plan, whence a small split is taken off to ventilate Dan Morley's heading. This air went along John Charles's heading through the 13 yards fault, back through James Simonds' heading, through Tom Boatman's heading to the main level (intake) heading. This air, however, did not then pass any workings at that time in operation, nor had these workings been in use for a month past or more before the explosion, so that it did not then actually ventilate any of them. Going back to point 6, the air went along the "labourers' heading" to the extreme south face of the heading or workings rather marked No. 7 and No. 8 on the plan. These are the two horns marked E. and west respectively. The air then turned eastward to 8 along Coleman's heading, then northward along the face to John Miller's and John Gibbon's heading, No. 9. The air then travels up Gibbon's to Coleman's heading along a point marked 10 (where a split from California comes in and joins it). These united airs then go into Partridge's heading, and along it to No. 11, where there is another split. Here the air is divided, a portion continuing along Partridge's heading to the air crossing, marked on the plan near the stables, where it joins the return from the west district, thence to the upcast (Middle Pit); the remaining portion from 11 travels easterly, through a hard heading to the point marked 12. It then turns south, thence through some old workings to the airbridge ✕ near the spot marked 2*a*, ventilating some old workings, joining the return close to the bridge, and thence to the upcast (Middle Pit). Starting again at point 3, a portion of the air goes down Lewis's heading, ventilating Constantinople and California, and it goes thence to the point marked 10, where it again joins the air ventilating the south district, which has already been traced to the upcast. I told you of a split going back to No. 2*a*, the split was taken along an airway, southwards to a point marked 13 on the plan. All that we have been describing is on the 6 feet. At the point which I have just previously mentioned, it was taken into air-pipes, and thence into the cross-measure (or hard heading) to the 4 feet or Polka seam at No. 14. Then it returned down the cross-measure heading and joined the other air under the air-bridge, at or near the point 13 passing under the bridge, thence to the upcast. This is the whole of the system of ventilation, and in my opinion was amply sufficient. I often went under ground to inspect the workings. The date of the explosion was the 13th of January 1879. I was last down before the explosion on the 19th of December 1878. I was at the colliery on the 28th and 31st of December and 1st of January to meet Col. Hunt, and as I was wanted on business at the top, I did not go down the pit on any of these three occasions, as the duties on the surface occupied all my time. During the week before I was in London on business. On the last visit in the morning, I went down the Middle Pit through the cross measure into the 4 feet, and I examined all the workings in the west 6 feet, beyond the fault, going by the one return and coming back again through the other. I did not go to the south. Then I came up, and went into another part of the pit, which has nothing to do with the explosion. I saw some gas in the 4 feet seam, then there was a fall from the top, near 14 on the plan. That fall was not considerable, about three feet. This was on the 19th of December; the gas was in the hole about a foot deep, I should fancy. It was not a large quantity, about two feet across by a foot deep. I stopped, and brattice-cloths and air-pipes were put up. The overman and manager were there with me, and I remained half an hour, seeing that what I directed was carried out. Mr. Hughes was manager then. We got rid of the gas before I left the place. I advised Samuel Hughes to put in a third row of air-pipes that night. This was between the points marked on the plan as 13 and 14. With that exception the ventilation was then all satisfactory to my view. I do not know of any large cavities or falls. There was a considerable fall where the Dinas fault crosses near to 2*a* and 14. This was while I was the consulting engineer. This was in the intake, where the red line intersects. This was about November. There was an artificial top made, so as to close up this cavity in the roof where the big fall had occurred. It had been timbered as soon as possible by my directions. It was so timbered that no one could get near it with a light of any description. Laggings were placed close together. There were small interstices left between. Air would to a small extent pass through them. The current under this timber was very strong. The whole ventilation of the pit, in fact, passed along below it through the return. There were not here more falls than in any ordinary colliery, since I had been connected with it. I cannot call to mind any other fall that had been similarly timbered. Small falls are ripped up so as to make an incline on each side, but where it becomes a large one, there is no other method of dealing with it, except that of timbering it up. This large fall was in the gut of the Dinas fault, which was a very large one of 40 yards and where the ground is very disturbed and troublesome.

By a Juryman.

All the air going down No. 1 went down No. 2 also.

By Coroner (for Mr. William Abraham).

As a rule I went down the colliery once a week, except when Colonel Hunt himself was here, and in that case I sometimes did not go underground. I do not recollect when last previously to the 19th of December I had been down the colliery, nor what

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part of it I then examined. I cannot say that I examined the whole of the workings when I was so last down before the 19th of December. I did so, say, at two, three, or it might possibly be more visits while Samuel Hughes was manager. I did not know that I was to visit the colliery under Hughes's management three or four times a week. When I found gas at No. 14, there were men working near it, towards the Middle Pit, about 20 yards from the fall. These men were not removed from the place where they were working, but they were prevented from working or going under where the gas was. They were engaged on the fresh air side, and I did not think it necessary to move them. They were on the return side, that is, the windward, and the gas would not therefore travel to them.

By the Coroner.

I find from the fireman's report book (*produced and referred to*), under date of December 19th and December 11th, and each succeeding day till the 19th, "Gas in John Morris's heading, all other places safe." I produce the book of special rules in force at the colliery. No. 2 of the general rules under the Act defines the fireman's duties. There were three day firemen and two night firemen. It is the duty of the fireman to report all gas. (*See* special rule 71, section 51, sub-rule 2 of general rules.) I find John Ace's name signed to this report of gas for the day work. William Lloyd's name is to the night report. Lloyd is now dead, having been one of those killed by the explosion. Gas is also reported at the same place first on the 11th of December, and every day thence till the 27th of December, and then it is stopped. Ace's book also reports it as continuing up to the 26th of December. The work I had advised to be done on that day was found to be insufficient, being temporary only, and the next day, I believe, the men were removed, though the presence of gas is still reported. While another row of pipes were being put in all work was suspended there, nor was any work going on while the pipes were being laid at all in that heading.

By Mr. Wheelhouse.

Except by the entry in the book I cannot tell you, that is, by my own knowledge, what was done between the 11th and the 19th, beyond what I have already stated, as to the removal of the gas, though I understand that the men were stopped from working there until another row of pipes had been put in. As consulting engineer of the colliery I do not think gas being left there for a week, in that quantity, would endanger the safety of the men, but steps ought to have been taken to clear it away. If it were a simple matter it could have been done by the fireman in half-an-hour; if he saw any difficulty in the way it would be his duty to stop the men, and report it to the overman, and, in case of that failing, a report should be made to the manager. It is not usual for gas to remain day by day for a week, whether in large or small quantities. The gas ought to be got rid of, or the men stopped during that period. Gas was reported up to the 26th, which is to be explained in this way:—The temporary measure which I caused to be adopted on the 19th was not found effective, and the putting up of an additional row of pipes was proceeded with. This went on up to the 26th, during which time gas was reported from day to day, but no actual work went on, not even at the distance of 20 yards.

By Mr. Simons.

When Samuel Hughes became manager there was no change in my duties. I was present when Hughes was appointed. Absolute control was given to him, and he was told he had power to stop all workings in matters of safety, but we advised him to act in consultation with Chubb, an older and more experienced man, in minor matters. Still we placed upon him (Hughes) the full responsibility, and relied upon him. We had advertised for a fresh manager, and had got one, the terms having been already agreed upon; this intended new manager was not Mr. Chubb. This gentleman afterwards declined to fulfil his engagement. Under Chubb's suspension we were obliged (by the Act of Parliament) to choose a temporary manager. I am secretary to the board of examiners of this district. In my opinion Hughes was a man who could have a certificate of competency as readily as many who have received it.

JOHN CHUBB sworn; examined by Coroner.

J. Chubb.

I live at Dinas, and I am the overman at Dinas Colliery. I was appointed overman a few days after my certificate was suspended, which was done on the 19th of November 1878. Before that time I had been certificated manager of the Dinas Colliery for 12 months, that is, I had been such manager from the 1st of November 1877 onwards. Morgan Rowlands was the manager immediately before I came. I was reported on account of gas in No. 4 (Polka) seam when I was driving a heading. There was an accumulation of gas when Mr. Galloway, the then Assistant Inspector, visited the colliery. He reported this, and it led to the suspension of my certificate. After I was appointed overman I inspected the workings every day; I cannot say that I inspected the whole of them every day. I had a book to make a note of any gas being found there, as well as the fireman. I read the books every day, they were in the office. When I saw gas reported I inspected the place. I tried to remove the gas, or I gave instructions to the fireman as to what he was to do. This (*produced*) is the daily report book; I signed this book, which is an extract from the report books of the firemen whose reports are copied into it. I sign this book regularly, I sign each page. At the entry on the 11th, I recollect this report:—"Gas in John Morris's heading," "All else safe." I was there every day and inspected it. The fireman put up a brattice-cloth; he and I did it between us, but I do not know the precise day when it was put up. I was with Mr. James, the last witness, when he inspected the place on the 19th of December. The cloth was up there then. Before Mr. James came the cloth was not sufficient to clear the gas. Two pipes leading to the cavity were put up by Mr. James's directions. We commenced putting up those pipes there and then. We afterwards put up another set of pipes, also by his direction, from the top to the bottom of the heading, from 13 to 14. It took us a few days to do this, but I cannot say exactly how long. The only men who were working there were those who were employed to put in the pipes. At the time they were doing so gas continued in the places until the pipes were put up, but as to how much I cannot say, seeing we ourselves did not pass beyond the mouth of the pipes. The gas was then dispersed. I cannot say whether the piping was finished on the last day when the gas was reported, but there was not any gas after the pipes were put in. Sometimes there was not any gas there during the intervals. We were ripping up to make an incline during the interval on the outer side of the fall for the air to reach the cavity. We did not think it very serious, and therefore we did not stop the men from working. I cannot remember whether there was any other report of gas about that time. Falls are not reported in this or any other book. Reports are only as to gas. I cannot recollect when the large fall near the Dinas fault occurred, some weeks before the explosion. This was in the return heading. This cavity was 12 or 14 feet high, and was shut up, but I went up 12 feet into that cavity several times with a Davy lamp, and the cavity was boarded up with timber soon after the fall. I do not remember any other place but Morris's being reported for gas about that time. These are the names and the districts

J. Chubb.
22 April 1879.

of the officers engaged:—John Ace was the fireman on part of the south and part of the east districts, David Williams was the fireman in the south districts. Thomas Miles had the whole of the north district under his charge as fireman, William Lloyd was the night fireman in a part of the west district; Thomas Watkins was the night fireman in the other district. These two night firemen had the whole of the district under their charge. During the big fall no coal has been raised, and the word "defective" in these books was an entry while the pit was so stopped. There is also an entry in the "Sudden danger Book," now produced. The report made on the 2nd of December is "All safe again." This was caused by the large fall at the Dinas fault. On the 1st of December Lloyd reported, "Gas in David Morley's heading, no men working." This is also reported on the 2nd of December. On the 3rd all is reported safe. This gave more ventilation into Morley's heading. On the 7th of December the pit is reported "All safe, except "a small blower in Thomas Kirwan's stall." The meaning of a small blower is a little bit of gas that is continually escaping, and cannot be got rid of. Gas in Morris's heading is reported till the 25th. There was nothing else reported, except one or two small blowers. Up to the 13th of January, "All safe, "except a small blower in Edward John's stall." I did not see this, because I was not down in the pit that day. I did not know that there was anything wrong after that. I was down on the 11th. The 12th was Sunday. All was safe on that Saturday (the 11th). I did not go over the whole, but I did go over the greater part of the workings on that day, but I cannot say how much. I considered the pit quite safe on the 11th to the best of my judgment. The air passing through the colliery was from 60,000 to 63,000 cubic feet per minute. On the 27th of December it is reported in this book (*produced*) that the men who worked in Morris's heading were readmitted, as the gas was "Now cleared off." On the 19th of December, the air passing through is 62,875 in the intake and 63,462 in the return. The pressure and barometric temperature are also reported in this book. There is a list of the men who were killed in the office. [The entry on the 28th of November, as to the state of the large fall on that day and the days following up to the 2nd of December, was here referred to.]

By Coroner (for Mr. Abraham).

My duty was to follow my instructions from the manager, Samuel Hughes, and to see the work properly carried out. As overman, I had to take control of the whole of the Middle Pit. No other overman but myself was in that pit at that time. While Hughes was manager I never did anything solely of my own conception. I always consulted with him and he with me. I used to employ and discharge the men if I had arranged with Samuel Hughes beforehand about it. I used to accompany Hughes to the Lower Pit, as I knew more than he did, but whenever I was in the Lower Pit, I always knew my fireman to be looking after my duties in the Middle Pit. Hughes was comparatively a stranger to the pit, and I knew all the workings. He was formerly the overman in the Middle Pit. I did not discharge men on the 1st of January, but Hughes did so on that day. I do not know anything about discharging David Davis. When my certificate was suspended, it was not the first time I had been accused of allowing gas to accumulate, and not taking out the men after its accumulation, by Morgan Rowlands, "but it was proved the other way." This was done while I was overman at the Middle Pit; it was some time in 1877, just before Mr. James became engineer. I knew Thomas Holmes who worked in the colliery. He was a sinker working in the hard headings. I knew Robert Chubb, a collier in this colliery. I remember my attention being called to two shots having failed to go off one morning some time before the explosion, but while Mr. Hughes was manager. This failure happened in the west district. The work was proceeded with that day as it ordinarily was. The shots failed in the night when I was not there. I heard the statement of the failure of the shots next morning. The two night firemen had been at the holes trying to discharge before I got there by drawing out the tamping; the two holes were subsequently and safely discharged before the men were permitted to work there. The charges were dug out and not fired off. I advised them not to do it in the way they were doing it, but I had nothing to do with the work beyond that. (Section e. of 8, p. 115 of Maskell Peace's book referred to.) I signed this book now produced after I had personally seen the places about which I made the entry. I never found these reports incorrect. There were men working on the fresh air side, but the gas would not go towards them, for they were on the intake. Mandrils were used for the purpose of ripping coal, not powder for it. I do not remember any other falls anything like so big as the one I speak of at the Dinas fault. We were four days clearing out the rubbish from that fall, beginning on the 28th of November and going till the 2nd of December, both inclusive. I do not know of any other large fall, but I have been there for seven or eight years. Two or three years ago there was even a larger fall than this, I believe. It was a very large one on the west side of the Dinas fault. The fall of which I last spoke was on the eastern side opposite, and this would make a large cavity on the west, I mean. There was only the timbering to cover the cavity. On the day of the explosion, I was all day in the Lower Pit, measuring off with the overman and fireman of the Lower Pit. Hughes did not accompany me there then. It had been arranged between me and Hughes the night previously that I was to go there. The manager was down all the day long in the Middle Pit; we were measuring all day in both pits. I signed the report book by the manager's evidence that night after I had spoken to the manager. This was an exceptional case, and I do not believe I ever did it before.

By Mr. Wheelhouse.

It is the custom to fire shots in this pit. I cannot say on the average how many shots were fired in a month. I do not consider it to be dangerous to fire shots where we did it.

Adjourned till to-morrow at 10 a.m.

Wednesday, 23rd April 1879.

J. Chubb.
23 April 1879.

JOHN CHUBB recalled, examined by Mr. Wheelhouse.

Supposing the shot, of which I spoke last night, had gone off, the nearest working place would have been 40 yards off. If I did not inspect the whole of the workings they would be inspected by the fireman. The Middle Pit was divided into three districts, and for each there was a separate day fireman. I have seen the reports of the "shift" immediately before the occurrence of the explosion. I have seen a "blower" going on continually for some months, and the means we generally take are to put a brattice up to throw

J. Chubb.
23 April 1879.

the air towards it. I did not often leave the fireman to do my duties as overman, but I cannot say how often. The staple through which the air passed was not walled from the top to the bottom. Occasionally men passed up and down the ladders when there was anything the matter with the shaft. There was a windlass in the top of the staple, and this was used sometimes. The lamps used were both Clannys and Davys. I do not know in what proportion, and the only open lights used were at the bottom of the shaft by the hitchers. The nearest working place would be 300 or 400 yards off, as nearly as I can say. I do not recollect when I last went through the staple before the explosion. I did not consider it my duty always to go through the staple. I do not recollect that I went through it at any time between the 11th of January and the 13th.

By the Coroner (for Mr. Abraham).

It was arranged between the manager and myself that I should be absent on the day of the explosion from the Middle Pit. I left the intimation with Mr. Hughes, and I did not give notice to anybody below me that I was going to be absent on that day. At present I cannot tell from memory how many men were working in each division under my supervision. It is recorded in the books of the pit (*book referred to*). In the Middle Pit the gross number of men working in that district were 266, night and day, on the 13th of January. The nearest large cavity was about 100 yards from where naked lights were used. One part of the main road between the shaft and the cavity was arched, but the cavity itself was not, having been timbered. There were three lamp stations, one in the intake and two in the return.

By Mr. Simons.

Naked lights were used at each of the three lamp stations. The nearest was about 50 yards from the great cavity. The fireman is the proper person to examine all the roads and working places before the men go to work. There was a mechanic who examined the machinery every day, and the shaft was examined each week. I know the 58th Special Rule and the 72nd Special Rule also (*referred to*).

By Jury.

I do not recollect going through the staple since I was overman this last time, that is, since I lost my certificate. I did not consider it to be part of my duty to examine the staple. A cavity might be covered by arching, which would be a more permanent job, and no doubt is also the safest. We used 30 feet timbering when necessary. We arched because the roof was bad in that place. Some of the arching along the main road had been taken down in Morgan Rowlands's time. This went from the bottom of the shaft to the place now arched. I inspected the top of the little pit on the 13th, and it was then safe, so far as I could understand it. The little pit was timbered, not walled. I never saw any walling there up to the accident; it is, however, walled now. We had lately been timbering close to the pit itself. I did not see anything unsafe. I do not know whose duty it was to examine the staple. The ladders were put there while I was manager. The depth of the staple pit is 78 yards. There was a windlass and ladders both. Once men went through this way as a travelling road, but only on that one occasion, and then they only went up because there was something the matter with the engine. It would take me four or five minutes to go up the ladders. By the staple pit I mean the Polka Pit.

By the Coroner (for Mr. Abraham).

On the Sunday night before the explosion no one was sent by William Lloyd; the fireman came to me asking me to go down the pit.

JOHN ACE sworn; examined by the Coroner.

J. Ace.

I live at Dinas. I was one of the firemen at the Dinas Colliery up to the time of the explosion. I was first a fireman about nine years ago. My districts were those of "California," and the west heading (John Morris's), and "Constantinople." I followed the instructions given to me by John Chubb, the overman. I was a day fireman. I had to go underground, and to inspect every place in the district each morning before any person, workman, or other, except myself, went in, and I always did this. My duty was to keep the pit in safety, so far as I could, and make reports of any danger I might from time to time see. I reported every evening what I found on the morning of the same day. I wrote them down in a book in the evening. I was round my district last about 4 p.m. On the 13th January, the day of the explosion, I went to every part of my district, and I found all safe to all appearance. I found neither gas nor "blower." I tried for gas in many places where I thought it might possibly be by putting my lamp up. I did not see John Chubb underground in that district that day, but I did see Hughes the manager there; he was measuring off when I saw him. I left my work about 4 o'clock, when I had finished my inspection. The books will show when I last found gas, that is, if I could not clear it at once, but if I was able to do so I should not make any entry in the book. The last fall before the explosion was the one in John Morris's heading. I cannot tell how long it was before the explosion that any other falls had happened, but they did occur very often. When a fall took place we put labourers to clear it away. If there were gas we put a brattice-cloth in the place where the fall was. We should timber up a "blower hole" if it were not a big one; provided there was no other or better way of dealing with it in our opinion. There are some holes timbered, which have been caused by falls, but I cannot say how many. I timbered up the hole in John Morris's heading, but I cannot say when it was done, but it was done as soon as we had enough of ventilation. There were three of us at John Morris's heading when the fall took place (David Williams, Miles, and myself). We were all engaged on the timbering up of the big hole by the Dinas fault. I never found any gas by this big fall, though I tried for it there many times. I tried for gas daily in John Morris's heading after I timbered the big fall, but I never found any.

By the Jury.

I have been fireman for nine years, and throughout the whole time in this district only. I sometimes went into my district by the one road and sometimes by the other. The top was rock in Hall's and Griffiths's heading (in California). I have seen "rolls" there, but no falls, that is, great ones. By a "roll" I mean the lip of the top, or small pieces of the roof where it is weaker, when perhaps a little might come away, and thus fall off. If I saw any gas in Griffiths's or Hall's headings, it is reported in the book, if I could not clear it at once. The other part of the roof (in Constantinople) is rock. I have not any recollection of a large "blower" in Constantinople or California. Timber was put into the roadways wherever necessary. The roof is of a different nature in Morris's heading; it is an indurable shale (cliff) there.

By Coroner (for Mr. Abraham).

I reported in the books that gas was present in John Morris's heading from the 11th of December to the 28th. I took steps to get more ventilation into John Morris's heading, and I got it by closing the place with a brattice. I had it across the heading. We put pipes there. I recollect Mr. James coming there. We put nothing else but the brattice until Mr. James came there. No men were working beyond that spot, as I stopped them from doing so on the first morning on which I observed the gas. We ripped it

J. Ace. 23 April 1879.

out with mandrils. The cliff required mandrils, and we ripped, and then timbered it up afterwards. I do not remember Chubb telling me the night before or the morning afterwards that he was not coming into his district on the morning when the explosion occurred. Hughes ought to have been able to look after the safety of the place while he was measuring, as he was in every place in my working district. There was not any overman in my district that day. Chubb was the only overman on my district. I should think it is the practice of the overman and manager, while measuring, to look to the safety of the mine also. There were two stalls into which rubbish was being taken. These two stalls were abandoned, and the only two in my district that were so, and we were then in the process of filling them up. These stalls would be about 40 or 50 yards deep. We sent rubbish into them as often as we had it, by day and night. One of these stalls was about half full, the other not so much filled, on the 13th of January. I cannot say how long it would take to fill up these stalls. I had plenty of other work to do, but I went there daily. We could have filled it in a week, but perhaps we had actually been a week or a fortnight doing it.

By Mr. Wheelhouse.

We did not fill it all at once. We began with the back, and, except keeping a wind-road to one side, we filled it to the top as well as we could. When we came about 15 yards off the parting, we filled it up entirely, wind-road and all, so as to make the stowing as safe as possible, before I came away from Morris's heading on the 13th of January, just after I tried for gas. Shots were not fired in Morris's heading on the 13th, neither were they fired on that day in any other part of my district. The deceased fireman, William Lloyd, would examine Morris's heading on the evening of the 13th of January in the ordinary course of his duty, and the deceased fireman, Watkins, would examine the rest from 5 to 7 o'clock next morning. I always examined every working place in my district every morning before the men went down, and if it were unsafe, I put timbers across, which would show the men that they were not to go into that place. Safe or unsafe, I always chalked up the date, to show that I myself had been there.

By Mr. Simons.

There were many stalls beyond these already finished with and stowed up, and they were filled up in the same way. I never met with any gas there, or if I did find any it is entered in the book to see. We examined the big cavity for gas, but not further than the top of the fall. I could not get up because it was timbered up. I never knew of any shots in my district missing to go off.

T. Miles.

Thomas Miles sworn; examined by Coroner.

I was a fireman at the Dinas Colliery for four or five months before the explosion. My district was George Mitchell's heading, and is the one generally called the top of the fault, in the Middle Pit. I was a day fireman. I inspected every place in my district every morning before the men went to their work. I inspected all the places, and all the roads, and I used to see to the general safety of the district, report any danger, and try (if possible) to remove it. If I could remove it during the day, I should not report it, but if there were any danger, I put cross-timbers at the mouth of the working-places, as the rules require. I made my reports every night by entering them in the book. I was all over the actual workings of the whole of my own district on the 13th of January, finishing my inspection about 4 p.m. It took me about two hours to go all round there. I had been three times round there that day, once in the morning before the men went down, and twice during the hours of work. I had found a small blower in Edward John's stall that morning. I tried to get rid of it by turning the doors and putting up a canvas. It was a gauge-door, which, therefore, was not always kept tight to let air go through the headings. We fastened a brattice on each side of the door. This did not get rid of the blower. No one was allowed to work there that day. I reported this in the book that evening. With the exception of this blower all was safe. This blower extended to the stall next to Edward John's. Benjamin Howell and I stopped him also from work. The air was not sufficient to dilute the gas before it got to Howell's stall and therefore I ordered him out. There was nothing else unsafe that morning throughout my district. There were not a great many large falls in my district, but there were a considerable number of small ones in it. I do not recollect any very large fall in my district. We always tried to remove any gas which accumulated in my district, by forcing the air up to the roof. We always timbered all the places which required it. I never saw John Chubb, the overman, in my district at all on the 13th of January, but I did see the manager (Hughes) there on that day. He went with me to look at John's and Howell's places, which I had previously marked off. At the time I saw him there Benjamin Howell's place was safe, and, therefore, we allowed him to go to work there. I do not recollect that anything else was done that day to clear away the gas in Edward John's stall. There was not any accumulation of gas, only the tongue floating away with the air. I saw the manager again about 3 p.m. in my district that day. He told me that we were going to work on a little later that day (Monday). We work other days, though not on Mondays, later, that is, till 5 generally, but on Mondays we cease, as a rule, about half-past 3, and he said that we were going to work on that day till 5. I cannot recollect whether he was engaged in measuring off in my district on that day or not. He did not go over all my district that day that I know of. Chubb never told me he was not coming into my district that day. Chubb's practice was not to come into my district every day. He came, as a rule, two or three times a week, since he has been made overman. He did not examine every portion of my district every time he came there. The manager also came into my district three or four times a week, but not every day. He did not inspect every part every time. I thought my place was perfectly safe, except as to the blower I have mentioned, as being in John's and Howell's that day. There were many places in my district that had been worked out. Some of these were in the process of being filled, and they had been filling from time to time as occasion served. They were generally filled in during the night shift, airways being kept and the rest filled up, that is the usual way. I tried every place in my district, filled or unfilled, for gas. I looked upon that as my duty and I did it. There were shots fired, though this was generally done by night, and when no coal was being raised. We always did the "dead-work" in the night-time whenever we could. I cannot remember when the last shot was fired in my district before the explosion, but it was not long before it.

By the Coroner (for Mr. Abraham).

If I could myself clear away the gas I did so, and reported "all safe." On the 13th of January I examined some of the old places, as well as all the working-places; for instance, I went to George Mitchell's heading, which had been cut shorter by a crossing from there to David Davies's heading, every day. Edward Johns worked inside George Mitchell's heading beyond the blower, and other men also. The blower was diluted in Benjamin Howell's stall to allow of his working there; at the second visit I made, and after I tightened the door, it was safe and clear. I did not stop the men beyond Benjamin Howell's stall because there was not any gas there. There was no explosive

T. Miles.
23 April 1879.

gas beyond that stall. I do not know what other work Chubb had to call him from the district on those days he was not there. I know nothing about the Lower Pit. I was the fireman for the district at the top of the fault. I recollect the occasion when the two shots failed to go off quite well, they were in my district. I believe this was on the 13th of December. William Lloyd told me, twice over, that both shots had failed to go off. The last time was when I was making my way out of the pit. I asked him what we must do; he said he had sent for Chubb, and must wait till he came. We went towards the place where the shots where, and when we got to it Chubb came to us; we then broke the ground down, and took out the powder. I do not recollect whether we had touched it before Chubb came, but we did not try to unram the holes, nor either of them; we were thinking of doing so, but I cannot remember whether we had commenced to do anything of that kind or not; I do not believe we had actually begun, though we had got two oak sticks in preparation for doing it. This happened just about the time when the men would be coming down from their work, but there were not any men, except ourselves, there then. When the powder was got out of the first heading the men went to their work there, but the rest of the men did not go to their working places till the powder was got out from the other place, and I told them all was safe. I did not then understand anything else than that it was incumbent upon me to make everything safe. I do not remember any other shots missing fire, so there was no "custom" about the manner of dealing with them so far as I knew.

By Mr. Simons.

Carrying the gob nearer the roof and nearer the face of the coal, according to the orders given that night, would have got rid of the gas, because it would have lessened the area for it. The ventilation was quite sufficient to dilute the gas, if the air could have been taken to the place where it was. We always pin the gob up. The way to get rid of gas is to dilute it with air.

DAVID WILLIAMS sworn; examined by Coroner.

D. Williams.

I live at Dinas, and I was a fireman there for about two years before the explosion. Mine was the south district of the Middle Pit. My duty was to ensure the safety of the workmen by going round myself every morning before the men came to their work. I always went three times a day, once before the men went to work, as I have told you, and twice during working hours. I was a day fireman. I went over all the places in my district, going through every part of my district every day, and I reported any danger there might be in the books, and signed the books every evening. On the 13th of January I had made my three inspections as usual, finishing the last of them about 4 o'clock. I found no gas in any part of my district. I went to every place, partly filled stalls as well as the others, on the last of my inspections that day. I had not had any gas in my district for some time before the explosion, a long time really (*book produced in corroboration*). I had not seen the overman down in my district that day. He came usually three or four times a week. Chubb was measuring in my district on the 13th of January. He would thus be able to see that all was safe. I never saw a fall in my district but one, about four months before the explosion. It was a big one; it took a post 13 feet long to reach the top. We timbered it up, and put some rubbish on the top of it. We sometimes found gas there before we timbered it up. We have not found any gas there since. We have always had bratticing there since. I do not know of any other falls in my time. It was in John Charles's or David Morley's heading, really in John Charles's. They had not been working in John Charles's heading for two or three months before the explosion. It was usual to fire shots when the hard heading was going on in James Simons' place. They were fired in the daytime. While I was there no shot ever missed going off. I considered my district quite safe on the 13th of January.

By Jury.

There was not any blasting arranged to take place on the night of the explosion, at least I did not hear or know of any.

By Coroner (for Mr. Abraham).

I went into the colliery every Sunday morning, it being part of my duty to go over my district on that day. I did so on the Sunday, the 12th of January, but I found neither gas nor danger that day. I did not see William Lloyd, the night fireman, that day (12th) in the pit. We carried up the rubbish on to the top of this 13 feet, timbering by stages, which is the usual way of doing that work. I put bratticing up while work was being done in Charles's heading, where the fall was. The brattice was put up like a door across the heading to carry the wind up. This was the usual method. This particular brattice filled up the whole of the heading, but did not fill up the entire of the height upwards. It was put six feet high, because we thought that was sufficient. We tried, after that, every day for gas, but we never found any there. I never saw a large body of gas in my district, though I did see a little one once in an old stall, but that is very nearly two years since, when Morgan Rowlands was manager. Coleman's heading was in my district latterly, but I have not during my time seen any blower in that heading. I have never seen more than one blower, and that is the one I have already mentioned. I recollect Morgan Rowlands leaving the management of the colliery. Chubb was then overman. I never had occasion to report a large body of gas existing in the colliery during Morgan Rowlands' time, nor did I ever report a large body of gas to Morgan Rowlands himself.

By Mr. Simons.

There is a regulated price allowed to the collier for putting up, or, as it is more generally called, "standing" timber. No shots had been fired in my district for full three or four months before the explosion, and then only in the hard heading.

Adjourned till to-morrow at 10.

S. Hughes.

24 April 1879.

Thursday, 24th April 1879.

JURY CALLED OVER; ALL ANSWERED.

SAMUEL HUGHES sworn; examined by Coroner.

I live at Dinas, and I was the manager of this colliery when the explosion happened. I am not so now. I was appointed manager on the 26th of November, and I ceased about the 24th of last January. I am now the overman at the Lower Pit. Mr. James and Mr. Wood (Colonel Hunt's colliery agent at Cardiff) told me that I had been appointed. I have not any certificate. I had given notice of my intention to go up for my examination about a week before I was appointed manager. The examination was to take place on the 28th of January. I did not go up for my examination on that day, so I have never obtained a certificate. The explosion occurred 15 days before the examination; Mr. J. Chubb had been manager immediately before I became so. Mr. James and Mr. Wood told me that as Chubb was an older man than I, I ought not to do anything without asking his advice. This was all they said to me. I understood that I had nothing to do, except looking after the safety of the colliery; nothing to do with the workings, which were to be left to the management of Mr. Chubb, who was to be responsible for the workings to Colonel Hunt. Chubb sometimes gave directions as to the workings of the colliery independent of me. Sometimes he engaged and discharged workmen without consulting me. I only knew what he had ordered to be done afterwards in those cases. I knew of the work by seeing it done after it had been done. He sometimes told me beforehand, but not always; sometimes I only found out what he had ordered by seeing the work. I never had occasion to object to the work that he had done. If I had thought that any of the work he had ordered to be done was dangerous I should have countermanded it. I had full power to stop any work he had ordered if I considered it dangerous, and if there had been anything I thought dangerous I would have stopped it. I went to inspect some part of the underground workings every day. I used to go to some part of the middle pit district every day. I do not recollect any single day when I did not go into some part of the district. I used to inspect the fireman's books of the previous evening on the following morning, sometimes twice a day. I never recollect being later than that. If I found gas reported I always went to examine the part reported as soon as I possibly could after I found it to be reported. There would be no delay, except where gas was reported in two places at the same time, in which case I must go to one of the two first, of course. After I saw the report I went to inspect it directly, unless I considered that there was something more urgent requiring my presence elsewhere. I recollect gas being reported in John Morris's heading on the 11th of December last. I inspected that heading, and examined it before it was entered on the report book. I went down before the men came to work, and the fireman verbally reported its presence to me, and I went to see it, and I ordered John Ace, the fireman, what he was to do, which was to try and put the brattice-cloth nearer to the roof to throw more air into the cavity, and I stopped the men who were at work from working that day. I am not certain that I inspected that same place on the following day. Gas was reported to be there for many days after the 11th, consequently I did inspect the place often afterwards, certainly more than every other day. There was not much gas there. The men have not been allowed to go back to work inside where that gas was ever since, but they were permitted to work outside in another heading on the same day. Mr. James came and ordered another set of pipes to be put in on the 19th. I was present when Mr. James gave the order to put in another row of pipes, and on the 26th the men went to work outside after the pipes had been put in. I considered it perfectly safe for the men to go back to this other heading then. I do not know that Chubb went down to the Middle Pit, over which he was the overman, at all on the 13th of January; he did not consult with me as to where he should go that day, but he went to the Lower Pit. The overmen were not allowed to go where they wished without consulting me. There were three overmen at the colliery altogether, two at the steam coal and one at the house coal. I was manager over the whole of them. The overman of the Lower Pit had on a former occasion made some slight mistakes as to the measuring off coal, and Chubb thought it was his duty, this time, to go and measure off himself. Chubb told me, on the Sunday night, that he should go down on the next day; I did not say anything to him. He said that he was responsible for the colliery expenses to Col. Hunt, and as he said so I was willing that he should go where he said. I went down the middle district on the 13th. The first time I remained from half-past 7 till 2 o'clock measuring that day. I went down again about 3.15 p.m. and remained down till 4.45 p.m. I measured also on this second visit; I went there for that purpose, and that was the reason I was so long there on that day, not because Chubb was in the other pit. It was not my ordinary duty to measure this pit, it would be Chubb's. I either inspected myself, or I caused the fireman to inspect all the places, in my presence, while I was measuring. I heard of the blower being found that day in Edward John's heading. Thomas Miles reported it to me while I was down in the pit. I went and looked at it. There was not much gas there, and it was only a small blower. I could see from where the gas was coming, it came from the roof; a few stones had fallen, but there was not any hole made in the roof, but there was a fissure or crack in it. The stones fell and then they showed the crack in the spot where they had been. If we held the lamp right under the crack (which we did) we could, and did, see the gas. It made a great "cap," at the place of issue, on the lamp, but we could not tell either the size or shape of the gas which issued. Edward Johns was not allowed to work in his stall on that day, but more air was turned into his stall. I went two or three times about a quarter to 8, back and fore. I was there three quarters of an hour, *but I did not go there after that day.* I ordered William Lloyd, the fireman, to pin it up tight that night, by completing a walling that had been commenced already in the stall, in order to increase the *velocity* of the current, although the *volume* of the current would be itself diminished, by contracting the space through which it passed. I did not order the day fireman to do this, because things were inconvenient to take to the place, that is, rubbish and so forth, and I did not consider it to be dangerous. We could not get rubbish easily there, without drawing down the roof in some other place, and it would be more convenient to get the materials in the night than in the day. To my knowledge there was no gas in other places in my district, except John's, on that day. I had been all over it except the northern part in which there had not been any new working coal for the last six or eight months back. All that portion of the pit was worked out, and the workings themselves had been abandoned. The whole of the Middle Pit was perfectly safe to the best of my knowledge when I left it that afternoon. I came up about 5.30 p.m., and went home. I was on the pit top about half-past 7. The explosion happened about 10.30 p.m., but I was not on duty at that time. I went to the pit after the explosion, as soon as I was told of it and I got there at 10.55 p.m. On the surface I found the cap of the Middle Pit (one of the two, that is) had

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been displaced, and blown upwards a short distance into the pit framing, but there was nothing else damaged there. I did not see any smoke coming up the shaft. There were 63 men and boys in the pit at that time (*list produced and read*). Up to this date (April 24th) only two bodies, those of Griffiths and Jenkins, have been recovered. One man was brought up alive, but he would make 64 down in the pit. The man who was saved was William Morgan, who was down attending to the pump in the Middle Pit, and the blast went clean past him, and he was afterwards safely wound up out of No. 3 seam, which is about 80 yards from the surface. This pump was used for forcing the water up out of the No. 3 seam to the surface.

By the Coroner (for Mr. Abraham).

I was first asked to undertake the responsibility of seeing to the safety of this mine about half-past 5 on the afternoon of the 26th of November, when I was asked to become manager. I was at the colliery on the 20th of November as overman, and I remained in that same capacity until the 26th. It was first asked me to take the management of the mine, with full powers of control over the colliery. Chubb first asked me this question, and he did so previously to my going to the office to meet Mr. James and Mr. Wood. After that Mr. James told me that I was to be responsible for the safety of the mine in accordance with the Coal Mines Regulation Act. After some further conversation, which I do not recollect, Mr. Wood said Mr. Chubb was an older man than myself, and I ought not to do anything without asking his (Chubb's) advice. Chubb occasionally visited other parts of the pit. Besides the Middle Pit itself he used to go to the Lower Pit. Sometimes he would go there four or five times a week. That would not be any part of his duty as an overman of the Middle Pit; he would go there under no further authority, except by virtue of the conditions I have previously mentioned. He did not always ask my permission to go; sometimes he would do so, at others he would not. He took upon himself the responsibility in regard to the working expenses of the pit, and I was not responsible for them. He said, "I will go into the Lower Pit to measure to-"morrow, and you go into the other, for Mr. Samuels "made some mistake when he was measuring on the "previous measuring day, so you had better go and "measure the Middle Pit." There was a general notice posted up to determine all contracts on the 31st of December 1878. This notice was posted up at the colliery on the 28th of November, I believe. It was signed "Coffin & Co." All the men were not re-engaged on the 1st of January 1879. I selected some of the men for re-engagement, Chubb the others. I last saw William Lloyd, the fireman, on Monday the 13th of January. He was in the colliery from half-past 2 p.m. on Saturday. He remained there till 10 p.m. on the Sunday night; he had some men in the pit with him timbering. On the Sunday, he would be timbering at the bottom of the Middle Pit. I am not certain at what time he would be going home for his meals. If he were timbering at the bottom of the pit, he could not have gone by without David Williams, the fireman, seeing him. It would not be any part of his duty to examine the colliery on that Sunday night (Wm. Lloyd's duty I mean), nor on the following Monday morning. David Thomas examined it on the Sunday night. David Thomas was the foreman haulier by night, not a fireman. I first heard of the two shots having failed to go off after they had broken away the ground from the place, and they had completed the work of getting the charges out. I cannot say for certain that I have heard of any that have failed to go off, except these two shots. Colonel Hunt sometimes visited the colliery while I was in office as the manager. He once consulted me when he was here. I cannot say whether he consulted any one else. It was either on the 28th of November or on the 2nd of December 1877 that I was first appointed overman. When I was made overman there was a windlass in the Polka Pit, and they were engaged in putting a ladder in at that time.

By Mr. Wheelhouse.

When these shots had failed to go off it was the duty of the fireman to have consulted the overman, and the overman the manager. Chubb, as well as I, took it from what Mr. Wood said, that it was Chubb that was to be responsible for the working expenses of the colliery. I do not know whether Colonel Hunt gave any further instructions, nor, if he did so, what they were. I know that a manager is responsible from the date of his appointment, but in this case I looked at it as divided responsibility. I accepted what I was to do from him (Chubb); he told me what I was to do, and I followed the directions he gave. Throughout the whole pit the system of working was, with very few exceptions, that of the "long wall." There had been no change in this respect since I went there. In one place we had a face of about 84 yards, but the average would be about 50 yards. There was a good deal of soft coal in the colliery; and, as a rule, the blowers were there, though I do remember one in the hard coal. If gas or firedamp accumulated in the stowage of the old workings it would possibly find its way out into the return air-way. The reason why I did not, as manager, go back to Edward John's stall after I had seen the blower there was, that I wanted to go down to the Lower Pit to see that they were all safe there, and I wanted also to see some other districts. Owing to the small quantity of gas I did not think that there was any danger; I felt satisfied in my own mind that there was not. The main difference I saw while I was the manager, and the time Chubb was manager, was that I, when overman at the Middle Pit, was always at my post, unless I was unavoidably absent; Chubb was not always at his post, but in other parts of the colliery. I am 24 years of age. I have been engaged in a colliery ever since I was 12 years old. Before I was appointed overman the first time, up to the end of November or the beginning of December 1877, that is, I was a working collier in the Middle Pit.

By Mr. Plews (who attended this day in place of Mr. Simons, his partner).

We very seldom had double shifts for working the coal, the night shift being used for timbering and repairs. The two shots were put in about a month before the accident, and in my opinion had nothing to do with this explosion. All this list of names is one of labourers, except three. David Thomas was a competent man. I made myself conversant with the rules of the colliery when I was made manager of it. All the work I saw done was safely performed for the working of the colliery. *I was not to do anything without consulting Chubb, and getting his advice.* Mr. Wood gave me to understand that Col. Hunt told me that. There was nothing said to me about Chubb's local knowledge that would be of any assistance to me. The danger from the blower I considered as being nothing, the directions I gave being in my view quite sufficient for safety. We cannot see the gas, we only know of its presence by seeing the "cap" on the "lamp."

By Coroner (recalled for Mr. Abraham).

I do not know of anything having been left undone that would have rendered the colliery more safe than it was; I could not have suggested anything additional. I was busily engaged the whole of the day when the blower was attempted to be remedied, therefore it was that I did not go to the place where it was again. The blower was not giving off gas continuously, and would not fill a lamp. This same blower has been appearing in different parts of this same heading, off and on, for

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the last six months. It was more convenient for the repairing staff to work by night. The place where these two shots were to have been fired was 444 yards off the place where the blower was. It is quite possible for a blower to fill up a heading in a very short time. In November 1877, a blower in this pit did fill up an entire heading in a very short time indeed. I could know that gas is flowing in the dark, as sometimes it may be smelt.

By Jury.

It was not possible that Edward John's stall could have been filled by such a blower as the one that was there, since there was too much air passing to have allowed the gas to fill the stall. If a manager chose to measure off, he may do it, but it is not customary in this colliery, though it is not contrary to his duty for him to do so.

L. Jones.

LEWIS JONES sworn; examined by Coroner.

I live on the Town Green, Dinas, and I am a collier, and I work at the Dinas Colliery. I was chosen by the other colliers to make an inspection of this colliery to see if it was all safe. Thomas Llewellyn and I were chosen to do this. We were chosen at the fortnightly meeting, and two different men are always chosen monthly. This is the custom at the Dinas Colliery. At each meeting one new man is chosen, the other remaining on till the following month. Last December I was first on. The colliery was inspected once a month, the same man going twice; that is, he makes two visits, one with a former comrade, and the other with the man who has been newly chosen. I went first in December, and again in January. Our visits were paid on the 3rd of December and the 3rd of January respectively. Philip Wild was with me on my first visit, and Thomas Llewellyn on my second. After each inspection we make out and post a paper at the pit head, so that everybody may read it, showing the state of the pit at the time of the inspection. We have no copy, but one is kept, signed by ourselves, in the colliery books (*produced*); I and Philip Wild signed the copy entered in the colliery book, as to what we found when we made the inspection on the 3rd of December 1878. This entry, which is now read, is quite correct, and what we found on that inspection is truly represented there. We had gone very carefully through every part of the workings in the Middle Pit. We reported the shafts in good condition; the levels clear from gas; the working-places in good condition, and clear from gas; the return air-ways clear from gas; the ventilating apparatus in good condition; the old workings in good condition, and clear from gas, and the machinery in good condition; and the report of the 3rd of January 1879 was very similar.

By Jury.

We took seven or eight hours each time to examine the Middle Pit. We had each a fireman's (Davy) lamp with us. We examined every hole we could see. If there had been any gas there, we should have reported it directly, without any fear of the management. I have been underground for 20 years, but never made any other such inspection but this one.

By Coroner (for Mr. Abraham).

We took a Davy because we were going round to examine the works. I always examined my own working-place in a morning, but the fireman had been there before me. We started at the bottom of the little pit, thence to a new place at the west, thence to Constantinople, thence to California, thence to Thomas Coleman's heading; I forget what name it was that I first went into in California, but I recollect going through Butcher's heading: we did not go through all the headings in California, but through five or six of them; I followed the man who was with me. We went through Coleman's heading and then through Partridge's heading. I do not know of any blower in Coleman's heading at present, but I have heard of one there a long time ago, but I do not know whether it was a large or only a small one. From Partridge's we went to David Morley's heading; we passed the labourers' heading because it was then choked up; thence we went to the dirty vein, a new one (Charles's heading). We came back through Boatman's heading. There was not any communication, as I think, between Boatman's and Morley's heading, or it was stopped up, if there were. Pentreven's heading was quite choked up. We went to George Mitchell's heading along the straight (Pen fault), after that to Tom Battle's heading, and we visited all the places except the roadways.

T. Miles.

THOMAS MILES, the fireman, recalled.

The lamps were always locked in the lamp-room at the pit's mouth, and were carried down the shaft by the men themselves, and then they were examined again at the bottom. If a man brought a lamp down which was found to be defective, he was either sent up again with it to the surface, where another was given to him in place of it, or if there were one to spare down at the lamp station at the pit bottom, it might be changed there without sending the man up again just then, but this scarcely ever happened.

By Mr. Wheelhouse.

If a lamp were broken, say, by means of a fall or a piece of stone, the light was put out immediately, the lamp taken to the lamp-station and exchanged for another. If matches, or keys, or tobacco, or pipes were found, the man who had them would be instantly sent out of the pit and taken before the magistrates; but I do not, of my own knowledge, know of any such case, nor of any searches having been made.

Adjourned till to-morrow.

Friday, 25th April 1879.

L. Jones.
25 April 1879.

LEWIS JONES (recalled by the Coroner for Mr. Abraham).

When I inspected, John Ace went with me to help me to do so thoroughly, and David Williams went with me also: John Ace going through his own district, and the others, Williams and Miles, each through his own district with us. Sometimes we went first; sometimes, perhaps, the district fireman might and would go before us, but only just before us, for we were always of the same party, as it were. We made no report to the colliers' committee which elected us, beyond the written paper which was posted up after each visit we made on the lamp-room door. Mr. Jones, the clerk at the colliery office, wrote out the paper for us at our dictation. There is a regularly appointed secretary to our colliers' committee. I have never made any similar examination at any other colliery than this. I have worked at another colliery, for I have been underground fully 20 years. I have been cutting coal in this pit for four years, and in other places before then in cutting coal.

L. Jones.
25 April 1879.

By Coroner.

I continued to cut coal up to the time of the explosion. I never knew of anything being in a dangerous state subsequently to our last report up to the time of the occurrence. I myself worked at the top of David Davis's heading, at the top, that is, of the "fault." Others among the colliers talk of the pit and about our work among themselves, but I never heard anybody say that there was any unusual danger about this pit. I never heard any caution given not to lift up the lamps near the top for fear of gas.

By Jury.

If I saw any gas, whether as one of the examiners of the mine or not, I should report it. If the doors were not right we should have to tell about them, so we should about the air-ways, if there were anything wrong with them, and about the top if there were any pieces or places that were bad. By the word "shaft" I mean the pit itself. Of course I know ventilation. I consider "old workings" to be places which have been worked out of their coal, and usually abandoned on that account. There were not any vacancies in the old workings when I was there, they were full up. I went through David Lewis's heading, and through the West heading, by way of the return. Lewis's heading itself was not a return heading. I went to John Charles's heading, or the dirty vein as it is called. I then went through David Morley's heading. There had been a fall in John Charles's heading, but it was timbered up. There was not any sign of gas coming from that place. We did not pass down as quickly as we should have done if we had been raising coal, but we did go down quickly, so much so as not to be able to make any very minute examination of the shaft. We looked at it as well as we could on our journey down. We did not ask them to go slower; it was our duty to make a thorough examination of the shaft as well as of other parts of the pit.

By Mr. Wheelhouse.

Twelve people were on the colliery committee, which was composed of our own workmen. This committee is changed every three months, and the delegates every month. On neither of the occasions when I made an inspection did I notice anything wrong. It would be better for the committee to keep a book for themselves, in which to record their report, as well as to put up the notice. I never saw gas when I was down in the pit. I cannot say what the fireman would do if the presence of gas were reported to him, but I suppose he would report it to the overman.

By Mr. Plews (for Mr. Simon).

This book, the men's report book, was always open at the office of the pit. The fireman only went down with us, but did not interfere with us in any way. We did not go into the roadways where the men were working from the main levels, as we considered that that would be safe when the men were working there, but when we examined we went into all the empty places where we could go, so as to see that all was safe, and we examined thoroughly, all along the faces.

By Jury.

I have never seen a funnel-shaped hole like this ∧ in the roof. I never saw any such hole in the top of this colliery.

T. Llewellyn.

Thomas Llewellyn sworn, and examined in Welsh, interpreted by Evan Thomas, of the Swan Inn, by the Coroner.

I live at Dinas, and I am a collier there. I worked at Smile's district of the Middle Pit up to the time of the explosion. On the morning that I was chosen as a delegate we went round the workings. I went with Lewis Jones. I had been a delegate for the same purpose in 1874. I had gone round on four several occasions, twice in 1874 and twice again just before this explosion. It is ten years since I first came to Dinas, but I have been away, although I have been eight or nine years now. I have been hauling and cutting coal all that time, having been a collier from my boyhood. I have been 22 or 23 years underground. I understood most but not all of what Jones said, and I thought what he said was right. We made as careful an inspection as we could according to our knowledge. We did not find any gas anywhere, nor any falls nor dangerous places. We went through each district in the Middle Pit, but we did not go through all the roads, nor did we go into all the roads turning off into the headings along the stall-faces. Yes, we went through every heading, so far as I know; yes, and to every face. We tried for gas throughout. We were surely about from 7 o'clock in the morning to about 2 o'clock in the afternoon, I think, down there. The examination was sufficient, because we did all that we thought necessary. My working place was by Lewis Jones's heading; they go side by side, on the top of the fault. I never saw gas there, but I have heard of it. For instance, I was told of it on the 13th of January last. That was a bit of a blower close by us in Edward John's stall. It was just dangerous enough to stop the man who was at his work there from doing so, but not more; there was not anything very particular. Now and then we asked men why they were not working, and they would say, "there is gas or something to hinder us." I never recollect any directions being given to us by overmen or firemen as to keeping our lamps low on account of gas being present. We did not examine the shaft particularly that day, because we saw it every day, but we did make a very careful examination all through when we got down into the workings themselves.

By the Coroner.

I cannot write, but we told the clerk what to write, and he did write; and when he had done writing he read what he had written down, and I put my cross to it. It was quite right according to what we told him. The clerk read it in English to my partner, and he told me what had been written by the clerk. We carried the paper to the lamp room, and my partner told me what the writing meant as we were going there. We examined all the places for other things besides gas. Except the blower in Edward John's stall, I heard of no other gas. About a month before I had had gas in my heading, but only in the stalls, not where I was working; but in the same direction as Edward John's stall. We went through Constantinople, down from there to Butcher's place, I think it was; but at all events we went through the old workings. We got into Constantinople by turning off through David Lewis's heading. The place is strange to me, but we went from there to Enoch's heading, but Enoch is not working there now. After we had finished that part we went to Coleman's heading. I was not in any place in California that I know of called Coleman's heading, but I did not know the place well. I only know by name Butchers, David Rowlands, and John Thomas, who were there working. Some call Rowlands' and Thomas' heading also by the name of Enoch's heading; this is the place (*pointing it out on the plan*) I mean. We returned from California to Coleman's heading. We then went to Partridge's heading. We did not go from that direction to the Pen Fault. We went to labourer's heading, and when we had finished the places that were clear there, we went into David Morley's heading, to a point where we could turn. We next went into a hard heading, I think John Charles's heading. We went to the return west heading before we went into California.

T. Morgan.

THOMAS MORGAN sworn; examined by Coroner.

25 April 1879.

I live at Dinas, and I am a collier there, and I was so up to the time of this explosion. I had been there from 10 to 11 months. I was working in Thomas Miles's district in the Middle Pit. I never found any gas in my place during all the time I have been working there. I have been a collier for 16 years, but I have been underground 24 years. I always tried for gas first thing in a morning when I went into my own working place. I never knew of anything being unsafe at the colliery before this accident. I never heard any of the colliers make any particular remark as to this colliery being dangerous, nor did I ever hear anybody say that they did not like to work in this colliery because of its being dangerous, nor did I ever hear any of the colliers say that it was either reckless or dangerous management. I found Thomas Miles to be a careful man. I am sure he inspected my place every morning before I went to work, and, so far as my knowledge goes, he did so by all the other working places in his own district. He examined before we went in, and regularly twice while we were working. Chubb was down at my working place perhaps three or four times during the last fortnight before the explosion. He came oftener previous to that last fortnight. Samuel Hughes came oftener than Chubb; Hughes came, perhaps, four times a week on an average.

By the Coroner (for Mr. Abraham).

I am now working at the Lower Pit. I know of John Chubb's certificate having been suspended; it was for some fault of his in the Lower Pit. I heard some of the colliers blaming him, and some not. I only heard of reckless management at that time.

By Mr. Wheelhouse.

I have worked about 14 months in the steam coal vein, this, the Dinas Colliery, being the first steam coal pit in which I have been employed. Chubb was forward in pushing the work on, though I cannot say that he was too forward. He was at the colliery in the mornings, seeing the men get to their work, and all that. He did not, to my knowledge, press the work on too fast.

W. Morgan.

WILLIAM MORGAN sworn; examined by Coroner.

I live at Dinas, and I am now a stoker. I was previously an engine-driver. I went down into No. 3 on the day of the explosion. The night fireman came down about two hours afterwards. I was driving the pump-engine, pumping the water out of No. 3 seam. About half-past 10 I heard a report, a very loud report, like a cannon going off; the doors were between me and the pit shaft. They were blown in. I was about 15 yards in from the outer door, and three yards from the inner one. They were broken; one was blown in, and part of it fell on my leg and injured it. I saw neither flame nor smoke, my lamp was blown out. I sounded the knocker-wire, and they sent down the carriage as soon as possible for me, and I was drawn up in safety. I found a current of air behind me, but I found no gas, nor any difference as to air as I was coming up in the shaft. I never heard any of the colliers say the pit was dangerous in any way.

By Mr. Wheelhouse.

I was using a naked light at the time of the explosion. I always used one, it being the rule in No. 3. The place where I hung my lamp, and which had been used for the same purpose before my time, would be about 17 yards from the shaft. The doors opened inwards towards the engine, and the blow which knocked down the doors would have to pass me before it got to the lighted lamp. The place was well ventilated from the pit up to the level.

By Mr. Plews.

The doors were all closed, and they were all right up to the moment of the explosion. The No. 3 seam is about 80 yards below the surface.

D. Rowlands.

DAVID ROWLANDS sworn; examined by Coroner.

I live at Dinas, and I am a collier. I first worked at this colliery in November 1877, at the Middle Pit, and in the California district there. I never had gas where I was working. To my knowledge I never heard any of the colliers say that the pit was dangerous. I never heard any particular complaints about the management being careless. I did hear rumours when John Chubb lost his certificate. The colliers blamed him for putting men to work while there was gas in the Lower Pit. John Chubb came into my place about twice or three times a fortnight after he was overman. Hughes, the manager, came oftener than Chubb. I sometimes tried for gas in my place, but not every day. John Ace was the fireman over my district. I found his mark there every day before I began to work. He came twice during every day. I think that he was a very careful man. I have heard colliers say occasionally to each other that the lamps were not to be held high up for fear of gas, but I do not remember either the time or the occasion when it was said. John Ace has himself told me not to hold my lamp up too high, saying "there is a little gas in the roof." He did not stop me from working when he told me this. It is 15 months ago. He only told me on that one day. Oh, yes! I think Ace told me twice or three times, just about the same date, not to hold my lamp high, but he did not stop me from working on any of these occasions. I did not, myself, think it dangerous, according to the quantity of gas there at that time, nor did I then hear of any complaint as to danger. I recollect a fall, a very large one, happening close to the Dinas fault; I knew of both places, but only personally speaking, knew of the one fall. The place of the other fall is not very far from the first one. I do not recollect ever having been told that we must be careful in passing these large falls, less the gas should come down upon us. These roadways on the plan are in the main level from the pit.

By the Coroner (for Mr. Abraham).

I began to work from the first in the California district. There was a very large "blower" which broke out in Coleman's heading, which was in my district about 12 or 15 months ago. The master hauliers sent all the hauliers out of the district when this happened. The master haulier of that district was William Jenkins. He was stopped by John Chubb on the 1st of January last, when he was discharged from the colliery. Jenkins said he believed that he was discharged for sending the hauliers out on that occasion. I do not know who discharged him. Jenkins was accused of carrying tales to Morgan Rowlands about the horses being employed "under height," and that this was untrue. Chubb accused Jenkins of this, and said that Morgan Rowlands had told it to Colonel Hunt. There was a horse killed by a stone falling from the roof, and John Chubb said that it had been told to Colonel Hunt that there were some stones hanging loose in another place, in which we were compelled to put two shots before we could remove them. There were other stones there, but they were not dangerous, as they were said to be, and we had put shots there to

displace them. There were about 20 or 25 other men who were not re-engaged on the 1st of last January. The overman told the men who were not then re-engaged that they must bring their tools out. John Chubb told the men in the Middle Pit, except Jenkin Evans, whom I myself told. I did not, myself, order that any man in the Lower Pit should not be re-engaged.

Mr. Wheelhouse here desired that Samuel Hughes, the manager, should be recalled, and he was asked by Mr. Wheelhouse (with the permission of the coroner), "Did you discharge Jenkins?"

Samuel Hughes (in reply) said:—

Chubb and I did it between us. We had a consultation before discharging him. We agreed that William Jenkins was to be discharged because it was said that Jenkins was carrying tales to Morgan Rowlands, which caused great discontent in the colliery.

D. Rowlands.
25 April 1879.

By Mr. Plews.

I did not see Mr. Wales, the Inspector, about that time, but I did see Mr. Galloway, who was then the Sub-inspector. It is very common to have a "blower" in the steam coal. Morgan Rowlands was the manager when I first commenced working at this colliery. I thought Ace could form a correct judgment as to whether it was dangerous or not, and therefore we did not come out when he told us to hold our lamps low. I found my place clear when I examined it afterwards. I never saw any of the other colliers trying for gas in their own places. I have heard them say, however, that they were not to hold their lamps high when there might be a little gas in their own places.

David Davis sworn; examined by the Coroner, giving evidence in Welsh, interpreted by Evan Thomas. *D. Davis.*

I worked in the Lower Pit at Dinas until the colliery stopped. We were under notice. Our time expired on the 1st of January. Chubb told me that I was to go. I was appointed to examine the pit as a delegate about nine days before I was stopped. I cannot tell you exactly who was appointed in my place, but there were two delegates I believe. They were to go round on New Year's day. I had a glass lamp. The lamp-man was getting a lamp ready. Chubb came and told me not to go down at all. This was at about half-past 8 in the morning. I do not know why I was not re-engaged.

John Gibbon sworn; examined by Coroner. *J. Gibbon.*

I live at Pennycraig, and I am a collier. I am now working at the Middle Pit, and I have been so since it begun eight or nine years ago. I have been working there off and on all that time, more or less up to the time of the explosion. I worked in Coleman's heading. I never found any gas in my place, and I considered my place quite safe, nor did I know of any that I looked upon as being otherwise. I had worked in other parts of the pit before the explosion. I have worked in Partridge's heading, and, indeed, at one time or other, all over the Middle Pit almost. I think, therefore, I have a good knowledge of the pit. I have been a delegate. I went twice round the pit under that appointment. I think we found two blowers, but this is now two or three years ago. We found one blower in the same place on the two occasions. We reported them. In other respects the colliery was quite safe, but these blowers were not so. The fireman knew of them before we inspected. I never heard any of the colliers or anybody else complain that the place was dangerous before the explosion. I always enjoyed the opinion that the Middle Pit was safe, and that it was properly looked after. I can read, but not well. I have read the colliery rules, however, for myself, but I have never read any books about gas. My evidence is that of a practical collier only, for I only worked in the pit, you know.

By the Jury.

I have been under the direction of different managers. As far as I know anything about the management, it has been as good latterly as it was before. I thought it always safe, and as a workman I was always satisfied. I have been a collier most part of my time. The workings were partly filled up after they were finished. I never saw any road filled only partly and chocked at the parting alone. The stall roads vary from 50 to 80 yards in depth. I have never seen 20 yards, or 10 or 15 say, unfilled. They were always properly filled up, except the air-courses through them. I never saw a lamp improperly open during the whole of my time. I do not smoke tobacco. I have heard rumours, perhaps two or three times, that the smell of tobacco smoke has been perceived in the pit. I myself never saw any one smoking, nor have I smelt any tobacco smoke at any time. I believe William Lloyd once told me that he smelt it. He was the fireman of the district in which I was then working. It was three or four years back. I never heard any report of that kind lately. There was some talk of the colliery being examined at that time for pipes and matches and lights, but I do not know whether it was done. All I know is, that I have never been examined in that way myself. I do not know whether anybody was prosecuted at that time or not. I am not sure, but my impression is that some one was then caught doing so at the time William Lloyd said he smelt tobacco smoke, and I think some man was fined about that time for having done so.

By Mr. Plews.

There has been a change of management about six or seven years ago and a change of ownership also. The change of management took place about the same time as the change of ownership. I think it was a Limited Company. There is some little rubbish sent out of the pit sometimes, I believe. It would depend on where the rubbish was made as to whether it was easier to send it out, or to use it down below. The roadways were all properly filled up.

Morgan Rowlands sworn; examined by Coroner in Welsh, interpreted by Evan Thomas (though this witness also answered many of the questions in English without waiting for the Welsh question to be put to him by the interpreter). *M. Rowlands.*

I live at Dinas, and I am a colliery manager. I was the manager of the Dinas Colliery, where this explosion occurred, for the ten years previous to 1877, but for a time, while I was ill, Mr. Edwards came and took my position temporarily, though I may say that I was the manager from 1867 there or thereabouts, and I had been in the level (as overman) for three years before that time. The level I mean is No. 3, the house coal seam. The colliery was properly kept till I left, and when I came away it was in a safe condition. John Chubb was the overman of the Middle Pit when I left. He was there nine years of my time, two of those years as the day overman and seven as night overman. I appointed him an overman. I have not been in the

M. Rowlands.
25 April 1879.

colliery since I ceased to be the manager. (*Letter produced and shown to the witness*). I wrote and sent this letter to Colonel Hunt:—

"Sir, Dinas, 14th April 1879.

"I have nothing to fall back upon but my character, and, so far as insinuation can go, you have done your utmost to ruin any prospects I might have had. I distinctly deny your charges against me with reference to articles in the 'Western Mail,' and the authorship of the heap of anonymous letters you spoke of to William Jenkins. In addition to this, you charged me, to my brother, with having driven the heading from the Lower Pit crooked. I defy you or anyone to show that the first 40 yards I drove were crooked. I cannot be held responsible for the failure of other people to understand my intentions. You blame me for a deficiency of foresight. I had sufficient foresight to see the explosion was coming, and was well aware of the cause; and I am only surprised you can be so indiscreet as to insinuate matters about my character, when you know that I concealed matters all through. I cannot refrain from saying you are neither fair to yourself nor just to me to give credence to every rumour which floats about concerning me.

"Yours respectfully,

"Colonel Hunt. M. Rowlands."

I sent two other letters before I sent this one. It is easy enough to see and understand that a conversation had taken place between me and Colonel Hunt before I sent this letter to him. I wish those letters were here, or either of them. By the one produced I only appealed to him to remind him of the conversation that had previously occurred between us, as I considered that I had fully informed him of that which was bound to come to pass, for it must be understood that I had sent him both the other letters before the explosion. When I left the Dinas Colliery I told him plainly what the consequence would be; he knew the reason of my leaving, and, unless he changed his course, he would be bound to come to trouble. After this man Chubb had lost his certificate I wrote to Colonel Hunt directly. The same thing had occurred that caused my leaving, of which I had told him. I wanted to dismiss Chubb, but the Colonel refused. I gave three charges against Chubb after I recovered from my illness of 14 months, during which time I had not been able to visit the colliery myself; these charges were for Chubb's allowing men to work where there was gas. They were all similar charges, and I told Colonel Hunt that I could not get Chubb to obey my instructions as he used to do; and the Colonel then asked me what it was, and I told him that I rose from my bed when the men were coming away from the 10 o'clock shift, and they told me that gas was coming from the face of the hard heading, 10 or 12 yards from the face. I sent them out, and I told the Colonel of it. They were five in number, and they were blasting. This was when Chubb was overman. I cannot say how long exactly, it was before I left, but about four or five months. I then reoprted it to the Colonel, and I told the Colonel I could not go on in such a way and be safe; and he told me that if anything happened afterwards he would let me stop him. In a short time afterwards, on the last Saturday in October 1877, I had another charge against him for leaving 40 cubic yards of gas in an old stall and heading within 40 yards of the working places. On the Sunday morning I sent to Chubb to say he must come to clear the gas, and that I myself and some others would go with him. He sent word back to say that we were enough without him, and we went without him and cleared away the gas. On the following Tuesday the Colonel came, and I then told him everything, and he inquired, I believe, as to the matter in the office. I went to Colonel Hunt's house that night, and asked the Colonel what he meant to do, and I then told him that I would not go into the colliery so long as Chubb was there. The Colonel told me I could stop him. The next morning I stopped him, and I went into the colliery. The Colonel sent word saying he wanted to see me. About 1 o'clock, I found Mr. Wood and Colonel Hunt; the Colonel told me he wanted to see me about half-past 2. At that hour I went, and the Colonel told me, first thing, that he was going to put Chubb back. I told him that he could do that, but if he did it I would not stop there one day, as I was in danger. Colonel Hunt told me, "If you are going, I am free from you." He added if I were going, he did not owe me anything, nor did I owe him anything. I told him that he had taken the management out of my hands, and I said "You shall see again." That was all that passed, and I have never been on the property since. This was on the 1st of November 1877. After that, when Chubb lost his certificate, I wrote to the Colonel twice, and asked him what he thought of it then? After the explosion I saw Colonel Hunt privately, and I went over all the circumstances I have named to-day, and I said that he could only have expected what had happened, as he had kept a manager who would allow the men to work in the gas; and he then also asked me what I thought about the explosion, and I told him I knew nothing about the colliery at that time, but it was plain enough that there was not sufficient air where the explosion took place, or it would not have happened. I believed that it arose from the fact of the Colonel having allowed a careless man upon whom he relied too much to remain as manager; it could only lead to this effect and consequence, and in my opinion this did lead to the explosion. Of course, I do not know it, but I think so. By "conceal matters" I meant that I concealed these matters from the public, and that I told no one of them except the Colonel himself and Mr. Wood. Mr. Wood was once present himself at a conversation.

By the Jury.

Colonel Hunt did not discharge me; it was I who refused to act as the manager, because I was not allowed to discharge Chubb. I widened the Polka Pit by Mr. Wales's instructions, but it was not walled immediately afterwards, though subsequently I caused part of it to be walled, but not at the top and the bottom, because it was hard ground both above and below. It was in David Morley's heading where the 40 cubic yards of gas were. On the other two occasions it was in the hard heading. Samuel Hughes was a working collier when I left. There were a ladder and a windlass at the Polka Pit. It was the duty of the overman of the Middle Pit to look after the Polka Pit, and by my instructions. Anything like a fall in the Polka Pit would interfere with the ventilation of the Middle Pit, the air communication going from one to the other. Very large falls occurred in the Middle Pit, two I can think of, very large ones. I never had one in the Polka Pit. (*Witness is here shown the map.*) One was in the intake, one in the return, close by the Dinas Fault. It was going up beyond the hard heading, going through the 13 yards' fault. There were very often small blowers in this pit while I was there.

By Mr. Plews.

I had been the manager at Marshall's Monmouthshire Colliery for some years before I came to Dinas. I was a fireman at the Cymmer Pit, but it is now more than 20 years ago. There was an accident there. I was blamed for it, and I was committed for trial for manslaughter, but I came away free from it. After I came to Dinas I was reported by Mr. Wales, about 14 days after I came, for an infraction of the Act, the complaint being that the pit was short of ventilation.

M. Rowlands.
25 April 1879.

When I went to Dinas to manage I found John Chubb a workman in the level, and I appointed him a night overman. I did this after I had been there about two months. I appointed him solely because at that time I thought him the best man there for the position. I cannot tell you the first occasion when I complained of gas being found in the hard heading. It was two or three months before I left. I had had a previous complaint about the part on the side of the river. I cannot tell you when that was. It was from six to nine months before I left. All the complaints I made were within nine months of my leaving. I had no complaint to make of him before I was laid up with my 14 months' illness; for seven years I had no complaint to make of him. After I came back he would not obey my orders as he formerly did. I was taken ill in September 1875. The first time I went back to the colliery was in October 1876, while Mr. Edwards was managing during my absence. I cannot tell you exactly how long Mr. Edwards was managing there altogether, but I suppose about three months during the time I was ill. Chubb was also managing during part of the time while I was ill, coming to me every night, and telling me how things were going on. I tried to go to the colliery in October, but had to go back again for three months. I was at the colliery perhaps a fortnight between my first illness and my return of it. I came back to the colliery about January 1877. I told nearly every man personally to let me know at once if he found gas. The first charge I made to the Colonel was about three or four months after my second return to the colliery. It was I who made the complaint to Colonel Hunt about the gas on the river side. I cannot remember whether it is reported in the book or not, if it be not reported it ought to have been. Thomas Watkins and James Williams were the night overmen at that time. One of these men is alive now. They also acted as firemen, and it was their duty to have reported any danger. Watkins was over that district. There were no men working there by night when I went in. The overman would have, or ought to have, reported gas in the morning, but I heard of it at night when I went in. At that time there was only one day overman, and there were the two night overmen, who acted as firemen also. I found the two men there when I went in on that night. We cleared off the gas. I believe it was Thomas Watkins who told me of it. When I heard of it I went to see it for myself, and I found that they had done nothing before I got down to them. I first heard of the gas in the hard heading at night, but it had been there during the day. On that occasion it would be about midnight after the men had all come out. I went the next day to have it cleared out. The same two men were still employed as night overmen and they were still there. The only five men whom I found there working I ordered to go out, and they came out with me. I spoke to the night overmen about his allowing the men to work there in the gas. The night overman had sent for me about 10 o'clock that night; they allowed the men to work, however, till I came. The night overmen would commence their duties about 6 o'clock; they did not tell me when they had first discovered gas; it might have been when they walked round, most likely about 7 or 8 o'clock. This had been going on for three or four hours about. We were then working three shifts. I blamed the chief overman. The day-shift came off at 2 o'clock p.m. The next shift, the afternoon one, would be from 2 to 10 p.m., and the following one from 10 at night to 6 o'clock the next morning. The work might have been left for an hour or two, I cannot say, but it was not likely. The day overman would leave about 5, after which time the night fireman would have charge of the place. The gas of which I am now speaking was about eight cubic yards, and was in the hard heading. Gas might accumulate to that extent in a couple of hours. As to the gas in Morley's heading, I went there about 8 o'clock on the Sunday morning. While I was in health I went and looked at the daily report book every day. On that occasion, however, I did not see the report book on the Monday or Tuesday; I was there on the Wednesday. I made a regular practice of looking at the daily report book; I saw gas on the Saturday, but I do not remember whether I looked at the report book or not. James Williams told me of this gas in Morley's heading, and he was dismissed, or had notice to leave, on the day I left. There was an inquiry into the truth of the statement as to gas which I had made, as well as of the statement made by Williams. I did not ask, nor did Williams tell me, when the gas was first observed to accumulate. I was told that by the night fireman on the Saturday morning. I never heard until now that my statement as to that gas was untrue. This gas was partly in a stall, and partly coming out to the heading. (*Witness is here shown the plan*). I cannot remember which stall it was, or the name of it. If a door were left open it might cause the accumulation of gas. On the Sunday morning I sent to tell the day overman, Chubb, in the way I have stated. On the Sunday morning the persons who ought to have made the report should have made it; on the Monday morning the first thing, when they could get at the report book to enter it, as reports were not made on Sundays. I went on the Monday. David Morley's heading was in David Williams's district during the day, but I am not sure who then had that district by night, but I think James Williams. I do not know that James Williams made any report in the book; no one told me. These men were called in, and saw Mr. Wood and Colonel Hunt, separately, as to this report about the gas, and were examined by them. I was present when James Williams came in, and then I went away. I had not any conversation with Watkins after that inquiry about it. I have not spoken to him since I left the colliery. I have never spoken about this to David Williams since. I never heard that David Williams denied the truth of my statement about the gas. Until I lately saw it in the newspaper, I never heard that John Chubb denied my statement about the gas. I do not know whether it was entered in the report book as a conclusion at which Mr. Wood and Colonel Hunt had arrived. The Colonel told me on the same day, but after the inquiry, to stop him. I am sure of this, for I left the colliery on the same day. I do not know when James Williams was dismissed. The gas was in an abandoned stall, then being filled up. All the other stalls (unused stalls) had been filled up. They had been filled up, some of it about half, but it was still unfinished. There was a tram of rubbish standing in the mouth. I have never been into the two collieries where I managed since I left them respectively. I had a feeling against Mr. Chubb, a strong feeling. I wrote to Colonel Hunt when Chubb lost his certificate. I had previously had correspondence with Colonel Hunt about my wages; yes, that very day. After that I insisted on having my wages, and I got them. I left in the way I have mentioned, and though I did so I claimed the three months' wages, and I got it paid. I did not threaten to sue Colonel Hunt until long after I had written to him about my wages. I was, perhaps, in a hot temper when I wrote the letters I did. The reason I wrote the letter now produced was because I had been accused of having had something to do with the correspondence in the "Western Mail" newspaper on this matter. I saw nothing in the "Western Mail" about my own character. I read the articles; it seemed as if they were against Colonel Hunt, but I don't recollect that they were against Chubb. I do not remember what the "Western Mail" says. If you tell me what articles in the "Western Mail" you mean, I will tell you whether I had anything to do with them, or any of them, or not. I felt before I left the colliery that something like this would happen, if things went on as they were going on. I felt this was coming on for seven or eight months before I left the colliery, and I could not stop them. Some of the men were working by day near the gas, and Chubb was the head overman and he let the men work there. After the night firemen came down they sent for me. On each of these three occasions I found the gas by night. I did not complain

M. Rowlands. 25 April 1879.

to the Colonel of finding gas there in the daytime, nor did I see it there in the day-time, but Thomas Watkins, who is now dead, told me about the gas at the river-side. James Williams told me about the gas in the hard heading; Williams is now working in my brother's colliery. There is a man now in this room who knows all about this matter. I have heard that they drove the heading to the Middle pit, which I had commenced. The colliery was satisfactory the day I left, for I walked through it before I came away.

By Coroner (for a Juryman).

Shots were fired as a usual thing in this pit during my management.

By Coroner (for Mr. Abraham).

There was a smaller fan by the Little Pit when I first went there. There was an arch at the bottom of the Middle Pit when I went there. I ordered it to be taken down, because I thought it better to have it away, insomuch as I found the arch was pressing in, and it was giving way. I put larger balks there five years ago. I could not find any blower by the Little Pit. I took William Jenkins and Evan Rowlands with me on the occasion when I went to clear the gas in Morley's heading. William Jones was working in the old stall, where the gas was, shifting rubbish.

G. H. James.

Mr. George Henry James (recalled by the Coroner).

There was an inquiry made into the truth of the allegations preferred by Mr. Morgan Rowlands and James Williams that a large accumulation of gas had existed in Morley's heading for four or five days. We examined the manager (Mr. Rowlands); the day overman, Chubb; the night overman and fireman, David Williams and James Williams; and the report-books for the same period. We found that no gas had been reported in that portion of the workings, either by the day or the night firemen, and we found that Mr. Rowlands had taken no steps to remove the gas till the Sunday by Mr. Rowlands and James Williams, though, according to their account, it had existed four or five days; and the day fireman and the day overman told us they had examined the place. David Morley's heading, during the days when it was asserted to have been there, and that, notwithstanding the statement of Mr. Rowlands and James Williams, they had failed to to find any gas there. Knowing the strong feeling that then existed between the manager and the overman, and taking all the circumstances into consideration, we thought that the allegations were untrue, and we gave James Williams a month's notice in consequence. The report-book does not show any gas reported by the fireman in that heading or by the overman on that day. James Williams was thereupon dismissed, but was afterwards re-engaged by the Dinas people. This inquiry took place either at the end of October or the beginning of November 1877.

By Coroner (for Mr. Wheelhouse.)

I cannot say why Morgan Rowlands was not dismissed as well as James Williams. Morgan Rowlands was undoubtedly the more responsible man on account of the position he held, but I cannot tell you why (although we disbelieved his statement, in the same way as we put no faith in that of James Williams) he was not dismissed on the same occasion and for the like cause as led us to dismiss Williams.

Adjourned till Wednesday June 4th, at this House at 10 a.m.

Wednesday, 4th June 1879.

Resumed at 10 a.m.

E. Dukes. 4 June 1879.

Mr. Edgar Dukes sworn; examined by the Coroner.

I live at Cymmer, and I am a surgeon there. I saw the dead body of John Griffiths, upon whose decease this inquiry is now being held, on Saturday, the 1st of March 1879. I examined the body, but I could not tell the precise cause of death, the body being then in such a condition as to preclude all possibility of that being done. It was charred, and looked like a soddened, black mass, apparently no features, no mouth, nor eyes discernible. The limbs were al straight, and the body lay in a natural position. Notwithstanding that I could not tell the exact manner of his death, the body had all the indications of the man having been killed by the explosion at Dinas, to which this inquiry refers, and I have not any hesitation whatever in stating that his death was caused by that explosion.

No cross-examination.

W. Morgan.

William Morgan sworn; examined by Coroner (in Welsh, interpreted by Mr. Evan Thomas).

I live at Dinas, and I am now a fireman at the Dinas colliery, at which I have been employed since the explosion. I found the dead body of Charles Weedon on Saturday the 10th of May. I was also present when the dead body of William Williams was discovered; we found William Williams first. We found Weedon's body in the hard heading. It was somewhere about here (*points out the place on the plan*). It was nearly half-way up the heading.

By Mr. Wheelhouse.

I found Weedon's body naked, lying on its back across the heading. There was not any wall, or fall, or anything of that sort to stop him from getting out, but he did not seem to have had any chance of getting out. In my opinion he was killed by the force of the explosion itself. One foot was missing, and it was found some little distance off from the body. I found the body of William Williams in David Lewis's heading (*here on the map*). I think that William Williams had died from being suffocated. The body of Weedon was found nearer the place marked 14 than 13 on the plan.

By Mr. Simons.

We found a shovel and a hatchet near Weedon's body, but the hatchet was William Jones's. The shovel was Weedon's.

E. Beech.

Edward Beech sworn; examined by the Coroner.

I live at Tellykellan, and I am a collier there. I have been working for the last five years at the Dinas Colliery. I found the body of William Jones on Tuesday the 13th of May last. I found the body in the hard heading. It was about 100 yards from the place marked 13 on the plan, there or thereabouts.

E. Beech.
4 June 1879.

His body was laying flat on its back in the middle of the road. Some little portion of his clothes were on. His two feet were off; one of his feet was found about a yard from his body. He was killed dead on the spot by the force of the explosion. I had been working at the top of the fault in this same pit before the explosion.

By Mr. Wheelhouse.

I never found gas myself, nor have I heard any complaint of any. I have not heard of any complaint with regard to the management in any way. I do not think any miners or other persons engaged as labourers about the Dinas Colliery have ever left the neighbourhood, or the works, because they were afraid to stop working in the colliery. I had heard of gas being there, but I had never seen it myself.

By Mr. Simons.

I have never inspected the colliery on the part of the men. There is not any difficulty in seeing gas when it is present, for it shows on the lamp. It is usual for the men to undress themselves partly when they are engaged on their work. The manager was always checking us for it, saying it was not allowed; they used to take off their clothes because it was very warm in some places.

W. Morgan.

William Morgan sworn; examined by Coroner) in Welsh, interpreted by Mr. Simons (Solicitor), in the temporary absence of the Interpreter).

I live at Dinas, and I am a fireman there. I knew William Jenkins, a hitcher at Dinas Colliery. He was 35 years of age, and I know that he was at work when this explosion happened. His body was recovered from the bottom of the pit on the 1st of March. I identified it by some earrings which he constantly wore in his ears, and the body I saw when it was brought up to the top was undoubtedly his.

R. Williams.

Richard Williams sworn; examined by the Coroner.

I am a collier at Dinas. I have been, along with other men, clearing away the fall and rubbish in the Dinas Pit where the explosion occurred. For some time past I have been engaged at the fall at the bottom of the up-cast shaft. On the 28th of February, while removing the rubbish, we came upon a dead body; it had its legs uppermost, about 4 feet from the bottom of the pit. A part of the body was laying under the cage, and under the body there were some tramcars that were very much broken. That body was that of John Griffiths, about whom this inquest is now taking place as to his death.

J. Price.

John Price sworn; examined by Coroner.

I live at Pennygraig, and I am a collier. I knew Griffiths, and I identified his body by the clothes on it; his body was one of those which were brought up first out of the Pit.

J. Webber.

James Webber sworn; examined by the Coroner.

I was engaged at the bank top of the Dinas Colliery shaft. I let the deceased down, he came up again for a moment; then I let him, Griffiths I mean, down again, a second time, and the body I afterwards saw which was brought up, was his dead body.

W. Richards.

William Richards sworn; examined by the Coroner (in Welsh, interpreted by Mr. Evan Thomas).

I am a collier living at Dinas. I worked at this colliery before the explosion. I was last working in the Polka seam before the explosion. I was working off John Morris's heading here (*pointing out the place on the plan*) as long as it lasted; then I worked here (*also pointing out the place on the plan*); it is called Powell's heading where I last was. I had been working there about six weeks. John Ace was the fireman of that district. I do not remember any gas in Powell's heading. but there was a small blower in John Morris's heading. I did not see any gas myself. All this was in John Ace's district, and I myself was stopped by Ace for nearly a week from working in John Morris's heading; we were working there when I was stopped. Thomas Hughes was then working there along with me, in the straight. I think we were stopped before Mr. James came down. We were then sent to David Lewis's heading and we worked there. In a week after that we went to Powell's heading to work there. I saw a blower in the straight, that is, in Morris's heading; this was at the time when we were stopped, but there was not much gas there. There was not a bit of gas when we went to work in Powell's heading. David Powell was then one of the men engaged on the work there, so were both Hughes and Jenkins. I was not in the habit of trying for gas with my lamp. John Ace came round those workings every day. He went round before we ourselves went there in the morning, and most likely once or twice during the day afterwards. I always saw Ace's mark there before I began my work. I was working there the day of the explosion. I saw Ace's mark there on the morning of the explosion, and I saw John Ace afterwards, once I am sure, but I cannot say whether more than once. John Ace and Samuel Hughes were there together about 4 o'clock in the afternoon; I saw them measuring off for the purpose of taking the account. I did not see either of them trying for gas. David Powell and a boy named John Williams were there; the others were not there because they were on the night shift. There was a boy, William Richards, there; he was from 18 to 20 years of age. His body is in the pit now. I did not hear anybody say that there was gas in John Morris's heading, or anywhere about it. David Powell is here, in this room, now.

By Mr. Simons.

I recollect the pipe being put into Morris's heading. Before that, gas had been found in a hole in the top of the roof there; that was at the time when we were stopped. The top was then ripped, and they put in the pipes before they sent us back to work. There were then no persons left in that district where I was working, except those who were engaged in putting in the pipes. Ace and the other men did that. No one was allowed to go to work there till after the third pipe had been put in. They stopped the working in the straight, and limited the operations to David Powell's heading. They worked double turns in David Powell's heading night and day. They jobbed up the fore end of John Morris's heading, and a little to the right of it beyond. They jobbed in all the working places at the face. After the pipes were put in I did not hear of any gas being found in that place, nor did I see any gas myself. We changed from the day-turn to the night-turn every other week. At night the man William Lloyd who was killed was the district fireman. I always saw William Lloyd's mark before we went to work. David Powell started the heading, and therefore it was called by his name. I have been cutting coal for 20 years, and I know

W. Richards.
4 June 1879.

the appearance of gas very well when I see it in my lamp. I should have been bound to see it in my lamp, if it had been there; I could have smelt it also, before I could have seen it, because gas rises to the lamp. There was not any indication of the presence of gas in my lamp after that third pipe was put in.

By the Jury.

It is about 40 yards from Powell's to Morris's heading. Two out of the three pipes were behind David Powell's heading, that is, behind the parting. The third was placed beyond the other two. The two first pipes were so placed as to take air towards David Powell's heading, into an air-way there, the other was taken onwards from there. I was never told not to go to the top of John Morris's heading, nor did I do so. Some 15 or 20 yards of John Morris's heading is not filled up beyond the parting of David Powell's heading. The third pipe began at the bottom of the hard heading, and it was carried in for about 20 yards short of the face of John Morris's heading.

By the Coroner (for Mr. Simons).

The air swept back along John Morris's heading, down the hard heading.

By the Coroner (for Mr. Wheelhouse).

I do not recollect of any persons emigrating or leaving the neighbourhood because it was dangerous to work in the Dinas Pit.

D. Powell.

DAVID POWELL sworn; examined by the Coroner.

I live at Dinas and I am a collier there; I was working there before the explosion. I was turning from Morris's heading into the new heading called by my own name. I had been working there about two or three months before the explosion. John Ace stopped us from working there on the 11th of December, on account of there being gas in that spot. That was in Parry's stall on Morris's heading; I was not there, so I did not actually see the gas myself. I was then sent to work in Coleman's heading. We were there a little over a week, and then after the pipes were put up, we came back again to work in my own former heading. They had put in a third pipe while I was away. I did not find any gas in my heading when I came back to it. I worked in my own heading regularly from the day I came back to the day of the accident. I did not find any gas in my heading, but there was gas, a blower, in the parting at our heading, though that was clear when we went back, and after that I did not find any gas at all. John Ace inspected the places every day, in the morning, and once or twice afterwards. I saw both him and Hughes there on the day of the explosion, but I did not notice them trying for gas at all. Parry's stall went parallel with mine, and there was another small blower about 10 yards off, from Parry's stall. This was 33 (measured) yards from John Morris's heading. I never went to Morris's heading after I came back from Coleman's heading, but I never heard of any gas having been found there after I had come back. They did say, however, that it had been cleared away. John Ace said that the gas was bound to be cleared away before we went back to work at that place.

By Mr. Simons.

Before I came back from Coleman's heading, they had ripped up the top of Morris's heading to the hard heading. This was to clear the blower.

J. Ace.

JOHN ACE recalled at the request of the Jury; examined by them.

The nature of the ground at the hard heading was a mixture, some soft and some hard ground. We had to timber the top in some places. There were not any very big falls, but there were many small ones. I have sometimes examined the colliers for matches, keys to open lamps, but I have only done this on some very few occasions, and I cannot tell you when I last did so. I never found either matches or keys, but I have found tobacco pipes. I did not notice whether they had tobacco also, but if I found pipes I always took them away. I never found anybody tampering with his lamp or opening it, except at the proper lamp-station. There has not been any prosecution before magistrates that I remember, but there were some men who were fined 10*s.* each under the rules of the colliery. The last time this occurred was, I think three, or four years ago.

W. Price.

WILLIAM PRICE sworn; examined by the Coroner.

I am one of the serjeants of police for Glamorganshire, and I am now stationed at the village of Pandy, just below here. I last saw John Chubb, the person who was a witness, and has been so often mentioned in these proceedings, on Monday week last the 26th of May, at the Ystrad Railway Station, in the Rhondda Valley. All that passed between us was that I said, "How are you, Mr. Chubb?" and he said, "How are you?" I forwarded a paper sent to me to the Superintendent Matthews. Police constable Williams had sent that paper to me. I had a verbal communication on Saturdy evening last, but I do not recollect who it was who made it to me. I have not been to Chubb's house myself since.

Adjourned till to-morrow (Thursday) June 5th, at 10 o'clock a.m., at this place.

Thursday, 5th June 1879.

Jury called over, and 17 jurymen having answered to their names—

W. Price.
5 June 1879.

WILLAM PRICE, police officer, was recalled, and in reply to Mr. Wheelhouse, said—

I saw Mrs. Chubb last night, and from my own personal inquiries and observation, I am satisfied that the witness Chubb is not now in this neighbourhood.

SAMUEL HUGHES recalled by the Coroner at the request of the Jury. *S. Hughes.*

5 June 1879.

This (*pointing out a place on the plan produced*) is Morris's heading. The men were working here previously to the 11th of December in William Richard's stall off Morris's heading. These men were named William Richards and Thomas Hughes. There were also two other men working in David Parry's stall, David Parry and David Jones, and there were two others in David Powell's heading, David Powell and William Evans. Evans is the man who was named Jenkins yesterday, and Richards was mistaken in naming him Jenkins. These six men were all, two in each working-place, they were then working on the 10th of December. There was not anyone at that time working in John Morris's heading itself. There was one labourer working in the hard heading on the 10th and 11th of December. When the gas was discovered the innermost men were taken away from the place. By innermost men I mean those nearest the face. William Richards, Thomas Hughes, David Parry, and Jones were all stopped and sent to work in another place in the 6 feet view. David Powell and William Evans were not stopped. Gas was first found here (*pointing to a place on the plan*), on David Parry's parting, in the second stall. These two last-named men were not taken away from their working-place, because they would not have to go through the gas nor under it, nor so far as where it was. Before Mr. James's visit there were only two pipes, extending from the spot marked 13 on the plan, nearly up to 14. These two were iron air-pipes. When Mr. James came on the 19th, he advised me to put in another pipe to the parting where Powell's heading was turning off. This was about 6 yards from the other two stalls. I considered that I was bound to follow Mr. James's instructions, for I looked upon Mr. James as being above me in the management of the colliery. It took us seven or eight days to put in the third row of pipes; that was from the 19th to the 26th of December inclusive. During all this time the two men who had been working in Powell's heading were withdrawn and sent to work in other parts of the colliery. Thomas Evans and John Ace, the fireman, were employed in the hard heading putting in this third row of pipes. No one worked in the hard heading except them during the time that the third row of pipes was being put in. The brattice was there before Mr. James came, but when he did come he ordered and we put up an additional brattice to the one we had already put there. This new brattice went across the heading to throw air up into the hole where the gas was lodging. Mr. James himself remained there while the brattice which he ordered was being put up, and this cleared away the gas before he left on that occasion. After the 26th of December four of the same men were brought back to work, and were put into David Powell's heading. These men were David Powell, William Evans, William Richards, and Thomas Hughes, and they all worked there, but no one worked in that place after the 26th of December, except for the purpose of stowing rubbish, as the incline was so very steep that we were going to gob the place up for the time, as in consequence of the incline or hard heading it was too heavy work for one horse to take up a tram-car laden, and we thought that as soon as we could get Powell's heading open to the upcast shaft, we should be able to have a pulley at the top of the incline, and thereby be able to let down five or six trams at a time. There were very seldom any men at work in the daytime at this jobbing work, it was mainly done at night; but a man named Evans did work there very occasionally in the daytime. His name is Aniram Evans, and he is alive now. These four men worked in David Powell's heading till the day of the explosion. The two stalls of which I have spoken were not completely gobbed up at the time of the explosion. I do not recollect that the men were ever absent altogether from this gobbing work at that spot during the whole interval up to the explosion. I do not think that I was in the colliery at any time by night between the 26th of December and the time of the explosion. These four men would always go to their work along the hard heading. On the day of the occurrence I went into the hard heading to Morris's heading, and into Parry's stall, but I did not go to the face of Morris's heading. It is about 17 or 20 yards from Parry's heading to the face of Morris's heading. I tried for gas all the way along the hard heading to Parry's stall, but I did not find any. I went also into Powell's heading and tried there for gas, but I did not find any about there either. John Ace was with me at that time. He could not go any further because Morris's heading was gobbed up to within a few feet of Parry's stall. There might, perhaps, be about 5 feet space between the end of the heading, and we went right up to the gobbing, beyond Parry's heading. I had been there almost every other day, between the 26th of December and the day of the explosion, and sometimes I went along there for two or three days in succession. After the 26th of December I did not see any gas there. Chubb and I never had any disputes about what ought to be done at the colliery. I never recollect his either getting or ordering anything to be done that I thought to be in any way dangerous to the colliery, or its working. Morris's heading was quite newly opened, and there were not any other places in work there beyond those which I have described. We had been working the coal there for nearly four months before the explosion. I do not recollect ever seeing any sign of gas oozing through the soft ground of the hard heading. We worked the coal from about 56 yards inwards from the point where we first struck it at the hard heading, that is, in John Morris's heading. David Powell's heading is 38 yards long. The Dinas fault separates the Middle Pit from the Lower Pit. The Polka vein on this side is altogether unworked.

By Mr. Wheelhouse.

The reason why we waited, and did not send for Mr. James was, because sometimes after the 11th of December we could place the brattice so as to clear the gas away in John Morris's heading; and we thought when Mr. James came we could and would consult him about it. He did not happen, however, to come on any one of those days, though he did very often come, and we were then expecting his coming daily. Sometimes he would come to the top of the pit two or three times a week. We should have waited till Mr. James came, if the gas were so small in quantity as it then was. I mean by "we," Chubb and myself.

By the Coroner (for Mr. Abraham).

I do not recollect Mr. James examining the colliery while I was the manager, except on the 19th of December, to the extent and in the way I have mentioned. On that day he examined the hard heading and the top of the fault, namely, the western district. This would be more than one-third of the colliery. For general instructions we should wait until Mr. James should be there.

By the Coroner (for Mr. Wheelhouse).

I cannot say, positively, that Mr. James ever came underground during the time of my management, except that once.

By Mr. Simons.

After finding gas on the 11th of December, we set to work ripping the top, as nearly as possible up to the level of the hole, so as to get rid of the hole by the ripping up to it, and we had already ripped all away up to the hole itself before Mr. James came. This ripping made it better, and then Mr. James advised the putting in the pipes as well. I had power, as I have said, to do what was needful for the safety of the colliery. Mr. James was not, of course, always there; he was the consulting agent or consulting engineer of the colliery at that time. It was not necessary to summons Mr. James on account of the gas that was there. I gave the directions for withdrawing the men while the third row of piping was being put in.

T. E. Wales.

5 June 1879.

MR. THOMAS ERRINGTON WALES, having been first sworn, handed in and read the following statement as his evidence.

I am Her Majesty's Inspector of Mines for the district of Glamorganshire, in which this occurrence happened. The Dinas colliery, in which the sad explosion occurred on the 13th of January last, consists of two shafts, called the Lower Pit and the Middle Pit, situate about 560 yards from each other. The Lower Pit, which is the downcast, is a round shaft, about 10 feet in diameter, and was sunk below the 4 feet or Polka seam of coal, but is filled up to the level of that seam, which is at a depth of about 329 yards from the surface. This shaft also passed through the 2 feet 9 inch seam at a depth of about 307 yards from the surface, at which point there is a landing for that seam. The Middle Pit, which is the upcast, is an oval pit, the axes of which are 15 feet and 12 feet, and is about 407 yards deep, having been sunk to the 6 feet seam, from which point only is coal being raised. The shaft also passed through the 4 feet seam, at a depth of about 329 yards, at which point there is an opening to that seam, but no coal landing, and also the 2 feet 9 inch seam at a depth of 307 yards, but at which there is no opening. Both these shafts are of sufficient capacity to pass an ample quantity of air for the proper and safe ventilation of the workings. A powerful Waddell fan, 40 feet diameter, was placed at the top of the Middle Pit (upcast) for producing the requisite current of air.

A Mr. C. H. James, mining engineer, of Merthyr Tydfil, was the agent, Mr. Samuel Hughes the manager, and Mr. John Chubb the overman of the colliery at the time of the explosion. The colliery was worked on the "long wall" principle; the discipline as to keeping records of examiuation, locking of safety lamps, was good, and monthly inspections were made by two of the workmen in accordance with the 30th general rule of the Coal Mines Regulation Act, 1872.

Previous to the explosion the air current in going down the Lower Pit was split, a portion going through the 2 feet 9 inch opening, and a portion through the 4 feet opening. These two currents, after ventilating the workings in those seams, joined at the bottom of the Staple Pit, sunk from the 2 feet 9 inch to the 4 feet seam, and passed in one current to the top of and down the Staple Pit, which is 78 yards deep from the "4 feet" or "Polka" seam to the "6 feet" seam. The current then after passing round and ventilating, as has been fully described by previous witnesses, the workings in the 6 feet seam, returned to the bottom of and up the Middle Pit, or upcast shaft, to the fan. This, then, is a brief and general description of the management and ventilation of the colliery at the time of the explosion.

From April 1878 to August 1878, by my instructions, four inspections were made of the Dinas colliery, by the then Assistant Inspector of this district, between the 13th of April 1878 and the 6th of August following.

Inspections were made of the 6 feet workings on the 13th and 27th of April, but no gas was met with on either of these occasions. On the 13th of April the quantity of air passing through these workings was 44,170 cubic feet per minute, and on the 27th of April the quantity does not appear to have been taken. On the 13th of June 1878 an inspection was made of the 2 feet 9 inch and 4 feet, or Polka, workings. Gas was found in both. This condition of things, which, however, was effectually remedied in the course of two or three days, was considered to be a violation of the Mines Regulation Act, 1872, and proceedings were instituted against Mr. Chubb, who was then manager, for a breach of the first general rule. He was fined 10*l.* and costs.

Subsequently proceedings were taken against Mr. Chubb, under the 32nd section of the Act, which resulted in the suspension of his certificate, from the 19th of November last, for six months. On the 6th of August 1878 another inspection of the workings in the 6 feet seam was made; the total quantity of air passing through them was 43,200 cubic feet per minute, an accumulation of gas was found in Coleman's heading, which is situate in the extreme south portion of the workings in the 6 feet seam. After receiving a report to this effect I communicated with Mr. James, both as to the accumulation of gas and as to the desirability of increasing the quantity of air, so as to lessen the "cap" and reduce the temperature, which, in some places, was from 75 to 76 degrees of Fahrenheit. It is only fair, however, to state that this high temperature was due more to the great depth of covering above the workings, they being 1,700 to 1,800 feet below the the surface, than to the scarcity of air travelling through them. Mr. James replied to me that the gas had already been cleared from Coleman's heading, and that steps were being taken to increase the quantity of air throughout the colliery. The quantity of air passing through the workings was taken by Mr. Chubb on the 4th of November 1878, and found to be 64,800 cubic feet per minute; and again on the 20th of December 1878, and found to be 72,750 cubic feet per minute. This was a considerable improvement upon the original quantity, and in my opinion, if judiciously distributed, was sufficient for the proper and safe ventilation of the colliery.

At the inquest, which has aleady extended over several days, a great deal of evidence has been given as to the state of the colliery previous to and up to the time of the explosion; but, so far as I can remember, no recent serious accumulation of gas had been spoken of, except that reported by the fireman, John Ace, as existing in Morris's heading, on the cross measures drift, from West's heading in the 6 feet vein to the 4 feet, or Polka seam. In his evidence Ace says, "I reported in the books that there was gas in "Morris's heading from the 11th to the 28th of "December. The ventilation was improved in this "part by placing brattices across the heading and by "putting up another row of pipes. No blasting took "place in Morris's heading."

Samuel Hughes, the late manager, states—

"I remember gas being reported in John Morris's heading on the 11th of December last, the fireman, Ace, told me of it before the men went to work. He had part of a brattice cloth, and I told him to place it in such a way as to throw more air into the cavity in the roof. I stopped the men from working at the heading on that day. For several days afterwards gas was reported there, and I inspected the place regularly, certainly more than every other day. There was not much gas, but inside where it was the men were not allowed to work. They were allowed on the 11th to work outside in a heading close by. On the 19th Mr. James came to the colliery, and he advised that another row of pipes should be put in. While this was being done we removed the men altogether from the district, and it was not until the 26th that they were allowed to return to the other heading that I have spoken of, which was then perfectly safe.

Mr. James, in his evidence, stated:—

"Starting again at the point marked 3, a portion of air goes down David Lewis's heading, ventilating the two districts called 'California' and 'Constantinople,' where it goes back to the upcast. Going back to No. 2*a* and southwards, a portion is taken back to No. 13. (This is still in the 6 feet.) At this point the air was taken through a small cross-hole into three air-pipes in the cross measures, or hard heading, and then into the "4 feet" coal. In my opinion this was an adequate and sufficient ventilation. I was in the habit of going down and inspecting the workings often. The explosion happened on the 13th of January. I last inspected the colliery on the 19th of December before the explosion. I was at the colliery on the 28th and 31st of December, and also on the 1st of January. On the 19th of December, in the morning, I went down the Middle Pit, and into the western workings

in the '6 feet,' beyond the fault. The only place where I saw any gas was in the '4 feet.' At a point near 14 there had been a fall of 3 feet above the coal, the gas was in a hole about a foot deep; it was not a large quantity; it was a couple of feet across. The fireman and manager were with me. I directed brattice cloth and air-pipes to be fixed. I remained there until the gas was cleared, about three-quarters of an hour. I suggested that another air-pipe should be put in that night. With that exception all was in a satisfactory state, so far as I saw."

Lewis Jones, a collier chosen by the men to make an inspection of the mine, said:—

"The committee of colliers appoint two men every month to examine the workings to see that all is safe. I was chosen in December; I went and inspected on the 3rd of December and the 3rd of January. Philip Wild was with me the first time, and Thomas Llewellyn the second, Wild's term having run out, the retirement being by rotation. We drew up the result of our inspections upon paper, and as usual placed them in a conspicuous position, so that all the men might see. These reports were copied into a book kept at the colliery office, which was signed by the men who made the inspection. On the 3rd of December we carefully went through every part of the workings at the Middle Pit, and we reported the shafts in good condition, and the levels clear from gas; the working places in good condition and clear from gas, the return air-ways clear from gas, and the machinery in good condition."

"The report of the 3rd of January was in much the same terms."

"We took seven or eight hours each time to examine the Middle Pit. We took Davy lamps with us. If there had been gas we should have reported it directly, with fear of the management. I was never engaged in making any other inspections."

On the morning of the 14th of January I heard of the explosion, and I immediately started from Newport, reaching the colliery about 11.30 a.m. On my arrival I found both the 80 yards staple, and the upcast shaft or Middle Pit had collapsed at the bottom, thus cutting off all communication with the 6 feet workings. I then descended the Lower Pit, and I proceeded along the "Polka" heading to the Middle Pit, in company with several other people. At that time, it was thought possible that the explosion might not have extended throughout the whole of the 6 feet workings, and that some of the men might have been reached alive, provided that a communication could have been effected in the course of a few days. From the 14th to the 23rd every possible effort, without stint of either men or materials, was made to reach the workings from the Middle Pit, but owing to the terrible wreck at the bottom of the shaft, and the large quantities of gas issuing from the interior of the colliery, it was quite impossible to do so. About noon on the 23rd, a consultation of engineers was held, when it was decided to discontinue operations at the Middle Pit, and to begin to clear out the 80 yards staple, and restore the ventilation in the usual way. Since that time the work of clearing the mine has been continued, but owing to the terrible destruction wrought by the explosion, a very small portion of the colliery has, as yet, been re-opened, and only six out of the 64 bodies recovered.

I have carefully inspected the portion of the colliery which has been re-opened, and from the indications I saw during my inspection on Thursday last, I am decidedly of opinion that the explosion took place in Morris's heading, or cross-measures drift, leading from the "6 feet" to the "4 feet." It will be recollected that the air for the ventilation of this place was conveyed through three iron pipes, each pipe being 12 inches in diameter. The force of the explosion had been so great here as to crush and twist these iron pipes into every conceivable shape, and at a point about 70 yards from the entrance of, and in a straight line with, the cross-measures drift, there were unmistakable indications of fire, and so far as my inspections have gone, no other portion of the colliery has been subjected to such force, nor were there any traces of fire to be found.

T. E. Wales.
5 June 1879.

These facts clearly and distinctly to my mind at least point to Morris's heading as the seat of the explosion.

It will be recollected that Ace, the fireman, and other witnesses, spoke to gas having been lodged in Morris's heading for several days between the 11th and 26th or 28th of December. This cross measure drift was about 150 yards in length, and rising at the rate of 1 in 7 or 1 in 8, and it will be borne in mind that the air for the ventilation of this heading was conveyed through three iron pipes, each pipe being 12 inches in diameter, giving an aggregate area of about 2½ feet, which in my opinion would be totally inadequate for the proper and safe ventilation of Morris's heading, where I believe gas to a large extent had accumulated. As shot firing was strictly prohibited in Morris's heading, it is impossible to state with certainty how the gas was ignited or exploded, nor do I consider it of much importance, for if gas be allowed to remain in or near working places, even where safety lamps are used, it will most certainly, sooner or later, be ignited by some means which probably will never be known.

I consider this explosion and consequent loss of life attributable to defective ventilation in that part of the colliery known as Morris's heading, or cross measures drift. Both in my reports, and on other occasions, I have condemned the use of pipes for purposes of ventilation, and I trust that this terrible calamity will prove to be the death blow to such a retrograde system of mining.

I cannot conclude my report without expressing my deep regret that John Chubb, who only two months before the explosion had been found guilty of incompetency, or gross negligence in the management of this very colliery, and who had had his certificate suspended for six months from the 19th of November, should have been appointed to act ostensibly as overman, but from the evidence adduced really acted as manager; thus practically ignoring the judgment of the court appointed by the Right Honourable the Home Secretary, under the 32nd section of the Coal Mines Regulation Act, 1872.

By Jury.

I could not have seen any indication of a large blower having been in Morris's heading when I inspected it on Thursday last. There was not any blower there when I inspected it. There were reports in writing, as to the then state of the colliery, after each of the inspections to which I have alluded. I have these reports now here. There is not anything in these reports, in respect of the system of ventilating Morris's heading. No official objection had been made by me, or reported by Mr. Galloway, who was then Assistant Inspector, as to the use of the pipes in this heading, but at the time of the last inspection on the 6th of August last, the cross measure drift had not nearly reached the coal, and consequently there was little or no gas given off. The cross measure drift is the same as Morris's heading. I consider that the proper means of ventilating this heading would have been by putting up a brattice until a communication had been made with the upcast shaft. The brattice put up on the 11th of December by the fireman John Ace, and the manager Samuel Hughes, was sufficient to clear away that particular accumulation, but not enough to dilute the whole gas, as I think the gas extended into the whole heading, and I think the third pipe ordered to be put in by Mr. James was also insufficient. I think a longitudinal brattice ought to have been put up in the heading, in order to have increased the quantity of the air. The intake airway that leads to the western part of the workings, and where Samuel Hughes stated that he heard shots were to be fired on the night of the 13th of January, is not

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near Morris's heading, and even, if shots were fired there, they could not have caused the explosion in Morris's heading. It is the custom in this district, in collieries of this kind, to use powder for blasting purposes to some extent. I do not consider it safe to use powder for blasting purposes in any fiery mine worked on the "long wall" principle. This colliery was worked on the "long wall" principle. It was the special duty of all persons connected with the management of the colliery, from the agent down to the fireman, to have seen that the gas was not allowed to remain in Morris's heading.

By Mr. Wheelhouse.

I think that, in the first place, as soon as the manager had found that there was gas in that heading he ought to have had the pipes removed, and replaced by a brattice such as I have described; if the manager did not do this, and there was gas there, the men ought to have been stopped at that part of the colliery, and, if the gas were accumulating, and the men were not stopped by the manager, I think the overman and the fireman ought to have stopped the men. In all human probability the fireman would have discovered the gas first, and if he made such a discovery, his duty would have been to stop the men, and to have reported the gas to the overman and manager. The duty of the overman would have been then to have consulted with the manager, so as to get more air, in order to dilute the gas. If sufficient air could not have been obtained, and the accumulation of gas was not dispersed, the manager should have had power to remove the boxes, and to have put up brattice; if the manager and overman found that it was impossible for them to deal with the case, they should have consulted Mr. James, but I do not think in this particular instance that the matter was of such a nature that the manager was incompetent to deal with it. By boxes I mean the iron air-pipes. When I made my inspection I think there were indications that a very large accumulation of gas had exploded in that place. My opinion is, that the gas would have been apparent to every one who went into the heading. It is possible that the gas had been going on increasing daily for some weeks, but I think certainly it must have gone on accumulating for several days. It would have been most imprudent to have gone on with this state of things without taking the men out of that particular place. I think the men were working in, or on, the heading at the moment of the explosion. This is shown by the fact of two bodies being found on the heading. I do not think that there could have been any blower, or sudden outburst of gas at this place. I think the accumulation was due to the insufficiency of air.

By Mr. Simons.

I think it possible that the condition of things at this heading may have been brought about after the 3rd of January last. On the 10th of December, John Ace, the fireman of this district, according to his report book, reported it quite safe, and, on the 11th of December he reported gas as being in Morris's heading, and that the men were stopped from that date until the 27th of December, when he reported "All safe." During the whole of that time the fireman reported gas as continuing in the heading, until they had got in the additional pipes. From the 27th of December up to the 13th of January inclusive, the place is reported by the fireman as having been safe. My opinion is that the volume of gas was so large that no fireman could have got into the place without seeing it. Morris's heading was at that time being driven towards the upcast shaft, which would have been an improvement when completed. The Dinas fault lay between this heading and the upcast shaft. It does occasionally happen that, in approaching a fault, there is sometimes a sudden outburst of gas, but this generally is in a new opening. The brattice would only be a temporary expedient until the heading reached the upcast; an ordinary brattice-cloth would have done. The iron boxes or pipes might have been more costly than the canvas brattice.

(Signed) T. E. Wales.

By the Coroner (for Mr. Abraham).

Upon what was Mr. Wales's information founded when he states in a letter to the Home Office that in addition to Mr. Hughes being the appointed manager, Mr. James, of Merthyr, was in the habit of examining the colliery once or twice a week, as occasion required. I have seen the letter in a printed document, though I have not got that with me now.

Mr. Wales (in reply).

I may just state that, so far as I remember, the words used by me were the identical words used by Colonel Hunt's Cardiff agent, Mr. Wood.

By Jury.

I do not think any further adjournment would or could, in any way, tend to throw any additional light as to the manner or cause of the death of either of these two men; and, indeed, it would only confirm the view I have already expressed to the jury.

After asking the Jury if they desired any adjournment for any purpose, or wished to have any further evidence, and having received a negative answer to both questions,

The Coroner proceeded to sum up the facts, and quoted the 26th section of the Mines Regulation Act, 1872, as to the appointment of a temporary manager, mentioning also the 32nd section of that statute, and placing before the Jury what amounted to criminal responsibility.

The Jury retired, and after an absence of about an hour and a half, came into court and returned as its verdict—

"That the death of John Griffiths and William Jenkins occurred through an explosion of gas at the Dinas Colliery, and that the origin of that explosion was accidental, and the Jury believes, from the evidence adduced, that it occurred through a sudden outburst of gas in or near Morris's heading.

"At the same time the Jury strongly censures the course adopted by the colliery authorities in placing John Chubb nominally as overman, but really as part-manager, after his certificate was suspended through his incompetency in conducting the management of the said colliery."

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Explosives Act, 1875 (38 Vict. c. 17).

THIRD ANNUAL REPORT

OF

HER MAJESTY'S INSPECTORS OF EXPLOSIVES;

BEING THE

Report for the Year 1878.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
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FOR HER MAJESTY'S STATIONERY OFFICE.

1879.

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THIRD ANNUAL REPORT OF HER MAJESTY'S INSPECTORS OF EXPLOSIVES;

BEING THE

ANNUAL REPORT FOR THE YEAR 1878.

SIR, Home Office, 1st January 1879.

IN accordance with the provisions of the 57th section of the Explosives Act, 1875, we, being the Government Inspectors appointed under that Act, beg to furnish this our Third Annual Report of our proceedings and of the working of the Act during the year ending December 31st, 1878.

Preliminary.

During this, the third year of the Act being in force, sensible progress has been effected in its application, and considerable exertions have been made, in many instances we are happy to say with marked success, to extend and strengthen its operation, and to reap the fruits of its protective provisions. In the introductory remarks to our last Annual Report we referred to a circular (dated 1st January 1878) which we had thought it desirable to issue to all occupiers of factories and magazines throughout the kingdom, calling their attention to the necessity of a strict observance in their respective establishments of the terms of the licenses under which they are carried on, and of the other provisions of the Act affecting the same.* The effect of this warning, coupled with what has been done in the way of actual inspections, if it has not in every instance been as marked or satisfactory as we could have wished, and if we have still had sometimes to remonstrate, and even in certain cases to institute proceedings, where we might fairly have anticipated that all ground for complaint would have disappeared, has nevertheless been substantially beneficial; and we are pleased to be able to bear testimony to a more strict and uniform observance of the statutory details in the majority of the factories and magazines which have come under our personal notice. There is still, perhaps, in some cases too strong a disposition to rely on the forbearance of the Inspectors, and to leave matters unattended to until a visit from one of us has brought the existing defects to light; but it is fair to remark that this observation is happily very far from being of general application, and it mainly applies in cases which the occupier perhaps regards as of technical rather than of intrinsic importance,—in such cases, for example, as the posting up of the requisite rules and notices for the guidance of the workpeople, the making due provision for the searching of magazine keepers to prevent the introduction of dangerous articles, the effective sweeping down of the interior of danger buildings, and the rigorous exclusion of every particle of grit. It is, perhaps, hardly necessary to observe that, apart from such matters being points of statutory obligation, we are not at all disposed to regard them as of minor importance. Each of them may be said to embody some principle of precaution, and it is to the neglect of some minute matter of detail, rather than to gross and palpable violations of prudence, that the majority of accidents are due. The various details of the Act were most fully and patiently considered before they were adopted. There is, we believe, no single one of those provisions which may not be fully defended on the ground that it constitutes one of many safeguards,—a joint in the armour which the legislature has forged and required to be worn as a protection against the combined risks which beset the various branches of the trade in explosives. It may even be said that there are very few of those provisions which had not been spontaneously applied in the better conducted factories and magazines before the Act rendered them obligatory in all; and we are disposed broadly to assert that there is not one of these provisions upon which a competent and disinterested person could place his finger and say, this one may be safely and properly dispensed with. On these grounds, therefore, we conceive that we should be assuming a very great responsibility, as well as imperfectly performing our duty, if we did not insist upon an exact observance of all statutory details, and a strict conformity with the letter of the law in matters of factory and magazine

* See Annual Report for 1877, pp. 3, 37.

regulation. Moreover, the Act is now so well known to the occupiers of the various factories and magazines, having been operative for three years, and its provisions having during that time been repeatedly brought under their notice by inspections and circulars, that there can be no longer any excuse for its non-observance in the minutest particulars. Non-compliance with its details can now scarcely be otherwise explained than by assuming either that the occupier has misconstrued a prolonged abstention from legal proceedings as implying that there is no serious intention to insist upon a strict compliance with all the minute regulations of the Act, or that he has deliberately elected to continue an illegal practice. We have, therefore, felt it our duty, in sixteen of the more flagrant cases of neglect,* to recommend or to cause to be instituted proceedings against the offenders; while, in a number of other cases, proceedings have only been foregone on the receipt of a distinct undertaking that the defects would be remedied within a period assigned by us, and the offender has been emphatically given to understand that this forbearance would not be repeated. But when all due deduction has been made on account of those cases in which the results accomplished by past inspections and warnings have been disappointing, the broad conclusion remains that during the year the effective operation of the Act has made good way, and the condition of the factories and magazines is generally very decidedly in advance of what it was at the date of our last Report, and, as a rule, perhaps falls little short of the standard which the Act is designed to establish.

We regret that we are still obliged to repeat our complaints of the inaction of too many of the local authorities. As we shall have occasion more particularly to explain, an important and very arduous part of our work during the past year has consisted in obtaining returns from the local authorities, and corresponding with them on the subject of those returns. We will not anticipate what we shall have to say on this subject further than to remark that these returns and the resulting correspondence, while they have been most useful, not merely in informing us as to the working of the Act by the local authorities, and in affording opportunities for correcting, in very many instances, the practice and misapprehensions of those authorities, have disclosed an amount of neglect and ignorance of the most elementary requirements of the Act on the part of several of the local authorities and their officers for which we were not prepared; and that neglect and ignorance furnish in some sort a rough measure of the degree in which the public fail to derive the full measure of advantage and protection which the Act is calculated to afford.

With these preliminary observations we will proceed to deal with the subject in detail, following as nearly as may be the lines and adopting the arrangement of our former Reports.

I.

Manufacture.

Manufacture. Number of factories.

The total number of factories (under Continuing Certificate and License) is now eighty-seven† (exclusive of toy firework factories, which will be dealt with separately), being an increase of four on last year, when the number stood at eighty-three. This increase of four does not, however, represent the number of new factories actually licensed during the year, because during this period three factories have been struck off our books. The total number of new factories licensed during 1878 was seven.

Factories under Continuing Certificate.

As regards factories under Continuing Certificate, there has been a diminution of two, owing to the certificates of Factory No. 17 (gunpowder), which had never been actually established, and of Factory No. 54 (fireworks), which has been pulled down, having lapsed under section 13. Factory No. 47 (ammunition), which has hitherto existed on paper only, has during the past year been brought into operation in time to save the Certificate. The total number of factories under Continuing Certificate is now fifty-three.

Factories under License.

As regards factories under License, although seven new factories have been licensed, one old one, No. 71 (fireworks), has become extinct by removal; consequently the present number of licensed factories stands at thirty-four, as against twenty-eight at the end of 1877 (exclusive of factories for toy fireworks).

Applications for factory licenses.

The number of applications for new factory licenses (exclusive of those for toy fireworks) received during the year was ten, and there were seven outstanding from the previous year. Appendix A. gives all necessary information with regard to the progress made with these twenty-three applications. As before stated, seven factory licenses were finally confirmed.

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* See Appendix T. In five of these cases the proceedings were instituted by the local authorities at our instance, the explosives having been seized by us.

† The number actually in operation is eighty-six, because No. 59 has given notice, under sec. 13, of temporary disuse.

These were as follows :—

One for a new explosive of the nitrate mixture class known as Espir's explosive powder (Factory No. 90).*

One for blasting cartridges made with gunpowder (Factory No. 88).

One for electric fuzes (Factory No. 86).

Four for fireworks (Factories Nos. 84, 85, 87, 89).

Appendix B. gives a table of all factories at present in existence, with the classes of explosives authorised to be manufactured therein; while Appendix C. specifies in detail the various descriptions of explosives authorised for the various factories, distinguishing between the factories in which they were authorised to be made prior to 1878 and which were licensed during that year.

We have seen no reason to modify the favourable opinions we have before expressed as to the sound practical working of the system of licensing which is laid down in the Act, and which appears to us at once to ensure a thorough investigation of all technical details when the draft license is under consideration at the Home Office, and to afford ample security for the protection of the public interests when the application comes before the Local Authority.

Amending factory licenses.

Forty-two amending licenses for factories have been applied for during the year, and twelve were outstanding from the year before. Appendix D. shows the progress which has been made with these fifty applications. The number of amending licenses confirmed during the year has been thirty-one.

The labour entailed in the consideration of applications for amending licenses, and the drafting of the same when the applications are acceded to, has proved of a formidable character, entailing as it does an attentive examination of all previous certificates and licenses under which the factory is carried on, and the adaptation of the terms of the former licenses to the new condition of things. Much of this work would be avoided if applicants for original licenses would bestow a little more trouble and attention at the outset upon the details of their propositions, instead of putting forward schemes which are no sooner launched than some alteration is recognised as requisite, and an amending license has to be applied for. The amount of time frequently occupied in the preparation of an amending license has proved wholly disproportionate to the very moderate fees which were originally laid down for such licenses, and I have thought it my duty to propose to the Treasury an augmentation of the fees for such licenses.†

New explosives.

The only new explosives authorised for manufacture during the year have been the following :—

Espir's explosive powder.

Espir's explosive powder, consisting of a mechanical mixture of nitrate of sodium, sulphur, and sawdust.

Fuzes.

Certain varieties of electric fuzes, electric detonator fuzes, and double detonator fuzes.

Pudrolithe.

Some alteration has been effected by means of an amending license in the authorised composition of the explosive termed "pudrolithe," which now is licensed to consist of a mixture of any two or more of the following ingredients; tan, sawdust, nitrate of soda, nitrate of baryta, charcoal, sulphur and saltpetre.

Blasting gelatine.

But in addition to the above a new nitro compound, called "blasting gelatine," has been added to the list of licensed explosives, a license to import the same having been granted. This substance was proposed by Nobel's Explosives Company (Limited), but the Company have not yet taken out a license to manufacture it, contenting themselves for the present with taking powers to introduce it from abroad, where it could be manufactured in one of Mr. Nobel's numerous factories. The licensed specification of the material is as follows :—

Blasting gelatine, No. 1, consisting of collodion cotton as herein-after defined, combined with thoroughly purified nitro-glycerine, and containing not less than seven and not more than 10 parts of such collodion cotton in every hundred parts, the whole to be of such a character and consistency as to prevent liquefaction or exudation ;—collodion cotton consisting of nitro-celluose thoroughly washed and purified, and of such composition that at least 95 per cent. of the dry material shall be soluble in a mixture of ether and alcohol.

Manufacture of toy fireworks.

In our last year's Report we referred to the subject of the manufacture of toy fireworks, such as bonbon crackers, "throw downs," &c., and we pointed out that the time had arrived when it became necessary to subject such manufacture to control and inspection,—explaining,

* Not yet actually at work.

† While this report has been in preparation, the new scale has been approved by the Treasury, and will come into operation on the 1st April. The scale of fees adopted is as follows :—

	1st.	2nd.	3rd.	4th.	5th.
	£	£	£	£	£
Factory amending licenses -	1	2	3	4	5
Magazine do. -	1	2	2	2	2

with power to the Secretary of State, when the amendments are of a character which do not entail much labour, to dispense with the full fee.

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however, the difficulties which beset it. That the risk arising from the uncontrolled manufacture in populous places of such apparently innocent articles might be a real and even a formidable one, was sufficiently illustrated by the disastrous explosion which occurred in a factory of toy paper caps (14 May 1878) in the Rue Béranger, Paris, and to which more particular reference is made in another part of our Report.

During the past year, we have gone very thoroughly into the matter, which is now, we are happy to say, placed upon what appears to be a satisfactory footing. The Treasury approved of a revised fee (5*s.*) for licenses for this class ; and we have found it possible, upon consultation with the principal people concerned in the trade, and after witnessing and carrying out some experiments, to formulate a set of regulations to govern the manufacture, and these have been embodied in licenses which the makers of these articles have agreed to accept. Up to the present time nine toy firework licenses have been confirmed (*see* Appendix A). In each of these licenses a condition has been inserted, subjecting the place of manufacture to the inspection of the officers of the local authority, and thus securing for them a more constant and effective supervision than, with other manifold and scattered duties, the Government Inspectors would be able to bestow.

The licenses are also made revocable at the discretion of the Secretary of State.

The only "toy fireworks" at present authorised to be made in these factories are the following :—

Snaps for bon-bon crackers.

"Snaps" for the bon-bon crackers which play so prominent a part at Christmas parties, and which consist of two little pieces of cardboard with a little sand gummed on to one end of each, and a tiny piece of fulminate of silver between. The pieces of cardboard are fastened together with thin paper, and the sudden drawing of them apart causes the explosion of the fulminate of silver and the accompanying report.

Throw-down crackers.

"Throw-down" crackers, consisting of a small quantity of flinty grit (ordinary road grit is commonly used) with a little fulminate of silver mixed with it, and the whole twisted up in a small piece of silver paper.

Toy caps.

Licenses are also in progress to manufacture toy caps, consisting of a mixture of chlorate of potash and amorphous phosphorus enclosed between two pieces of thin paper.

Small firework factories.

From the returns received from the local authorities it appears that the number of small firework factories (which must not be confounded with toy firework factories) which existed under license on the 1st April 1878 was thirty-five, of which one was in Scotland, and thirty-four were in England. (For distribution in counties, *see* Appendix N.) It is a matter of satisfaction to us that a provision of the Act which was designed to afford relief to the smaller makers, and to remove temptations to illegal and unlicensed manufacture, should have been taken advantage of to this extent. Our satisfaction would be more complete had we the assurance that these small factories were as strictly inspected by the officers of the local authority, and were as carefully conducted, as the Act contemplates. Unfortunately, excepting such places as the Metropolitan district, our experience so far does not afford us this assurance. However, if each of these factories represents a reduction in the number of persons who previously carried on an illegal and dangerous manufacture in dwelling-houses, the gain to the public is not inconsiderable ; and I trust that in time, as the local authorities and their officers become generally more alive to their responsibilities, and more prompt and efficient in their discharge, not only will the number of such factories increase, but the conduct of the same will more strictly conform to the precautionary regulations enjoined by the Act.

Manufacture of blasting cartridges.

We devoted some space in our last year's Report to the subject of the illegal manufacture of blasting cartridges by miners, and we set forth what we believed to be the law on the subject. We are glad to say that this view of the law appears to be no longer disputed ; we have noticed several convictions for the carrying on of this illegal and dangerous manufacture in unauthorised places. Moreover, in the course of our inspections we have ascertained that mine owners are now more disposed to establish workshops (under section 47) in which such manufacture may be lawfully and properly carried on ; while the assent of the Secretary of State to the establishment of such workshops in connection with existing magazines has during the year been obtained in one case, and in connection with stores under Continuing Certificates in another case.* Two of the magazines newly licensed during the year (Nos. 314 and 317) have had workshops attached.

There are also now in existence seven factories specially for the manufacture of gunpowder blasting cartridges for sale to miners ; and, taken in conjunction with the twenty-eight gunpowder factories in all of which this manufacture may be lawfully carried on, there can no longer be any difficulty in obtaining blasting cartridges ready made, even where "workshops" for such making do not exist ; and thus all reasonable excuse for the continuance of this

* The consent of the Secretary of State is not required in the case of stores *under license*, when a notice to the local authority is all that is required ; consequently the foregoing figures afford no real measure of the extent to which such workshops have become established throughout the kingdom.

illegal manufacture disappears. It rests with the local authorities, and with them only, to put down a practice fraught with much danger and objection.

Manufacture of cartridges for small arms.

The provisions of the Act which provide for the manufacture of cartridges for small arms by gunmakers call for no special remark. The year has happily been free from any such accident on a gunmaker's premises as we had to notice in our last Report; and we have reason to believe, from our inspections of the registers kept by the local authorities, and from our personal inquiries and observations, that this portion of the Act is on the whole working satisfactorily.

Illegal manufacture.

The only instance of the illegal manufacture of explosive, *i.e.* of explosive in an unauthorised place, which has come under our notice during the year, was the making of fuzes for blasting by a pitman in Durham in his dwelling-house. An accident occurred during this illegal making, and the unfortunate man paid the penalty with his life. (*See* Appendix W., Accident No. 96.) As we stated in our last Report, we have no reason to believe that, except to some extent in the case of fireworks and blasting cartridges and straws, with which it behoves the local authority to deal, such illegal manufacture is carried on. As was stated last year, it seems to us very unlikely that an explosive derived from an illegal source could get into active circulation without our becoming aware of it, sooner or later, in the course of our inspections, which extend to all parts of the United Kingdom.

General condition of factories.

We have little to add to the observations which we have offered under the head of the general condition of factories in our introductory remarks, from which it will be seen that on the whole we have little reason to be dissatisfied with the progress which has been made towards bringing the various factories up to the standard which the Act contemplates. It would of course be more agreeable were we in a position to report on this point without any qualification; but it will be seen from our record of convictions (Appendix T.) that in six instances we felt it our duty to take proceedings for the negligent observance of the Act in factories; and some of these cases were of an aggravated character, as, for example, the case of the Elterwater gunpowder factory, in which convictions were obtained for 12 offences, and the case of Mr. Bantock's factory at East Ham, where a conviction was obtained for the manufacture of some grossly impure wood gunpowder. In some others of the 80 factories which we visited during the year we have found irregularities which certainly ought not to have existed, and we have in some instances hesitated as to whether we ought to recommend proceedings. We trust that the warnings conveyed, and the publicity given to the prosecutions of other offenders, may have the effect of removing causes of complaint.

Notice given to reduce the amount of explosive.

In the case of one gunpowder factory (Elterwater) we deemed it our duty to exercise the powers vested in us by section 24 to require a reduction of the quantities of gunpowder present in two of the buildings. This is the first case since the Act came into force in which it has been necessary for us to have recourse to these powers.

Impure explosives.

In addition to the case of the conviction above mentioned for the manufacture of impure wood gunpowder, another instance came under our notice with some material of the same sort, which we found in the magazine of a factory near Liverpool, and which proved on examination to be excessively impure. In this case, however, there were circumstances which we felt warranted us in abstaining from legal proceedings, on condition that the whole of the impure material was destroyed, and this course was adopted.

The close attention which we have felt it our duty, especially in view of the disastrous consequences which resulted from the presence of a quantity of impure "wood gunpowder" on board the "Great Queensland,"* to pay to the purity of the various chemical explosives, has, we are happy to say, been attended with markedly satisfactory results. Factories which were before in the habit of turning out products of questionable purity, and even in some instances of unquestionable impurity, have, in consequence of the action of the Department, so remodelled their systems of manufacture as to enable them to produce explosives which pass the tests applied by our chemical adviser (Dr. Dupré, F.R.S.) with ease; and we have no hesitation in saying that the whole standard of explosives of the chemical classes has been materially raised.

During the year the subject of the nature and extent of permissible impurity in dynamite has formed the subject of a special and very elaborate investigation by a Committee of Chemists, consisting of Mr. Abel, C.B. F.R.S., Dr. Dupré, F.R.S., and Dr. Odling, F.R.S.; and their conclusions, together with the modifications in the application of the heat test which they have recommended, appear to have placed this important subject upon a satisfactory basis.

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* *See* Annual Report for 1877, p. 9.

II.

Storage.

Storage. Magazines.

Magazines.—The total number of magazines (under Continuing Certificate and License) is now two hundred and ninety-five,* being an increase of twenty on last year, when the number stood at two hundred and seventy-five. This increase of twenty does not, however, represent the number of new magazines actually licensed during the year, because fourteen magazines have been struck off our books. The total number of new magazines licensed in 1878 was thirty-four.

Magazines under Continuing Certificate.

As regards magazines under Continuing Certificate, the number now in existence is one hundred and eighty-two†, being twelve less than last year. This reduction has been effected by the following magazines being discontinued as such during the year; viz., in the case of six (Nos. 98, 101, 157, 180, 182, 185) the Continuing Certificates have been surrendered; two (Nos. 59 and 129) were pulled down; one (No. 199) became a "store;" two (Nos. 156, 189) lapsed through continued disuse, under section 13; and one (No. 71) was abandoned.

Magazines under License.

As regards magazines under License, the number now in existence is one hundred and thirteen, being an increase of thirty-two on last year. During the year two have ceased to exist, viz., No. 223 (dynamite), the license for which has been surrendered; and No. 230 (dynamite), which has been pulled down.‡ But against this reduction of two there has been an increase of thirty-four, that number having been licensed during the year, making a net increase of thirty-two in the number of magazines under License.

Having regard to the above-mentioned decrease of twelve in the number of magazines under Continuing Certificate, we have thus the net increase of twenty magazines of all sorts.

The thirty-four new licenses are distributed as follows:—

Sixteen for gunpowder only (Nos. 286, 287, 288, 289, 293, 294, 295, 298, 299, 300, 302, 305, 306, 312, 317, 318).
Four for gunpowder and safety fuze (Nos. 290, 308, 309, 310).
Four for explosives of Classes 1 to 4 and safety fuze (Nos. 285, 296, 311, 313).
One for nitrate mixture (No. 316).
Five for dynamite (Nos. 292, 301, 303, 314, 315).
Two for lithofracteur (Nos. 304, 307).
One for dynamite, safety fuze, and detonators (No. 291).
One for ammunition, consisting of detonating tubes and fuzes (No. 297).

Appendix E. gives a table of magazines with the classes of explosives authorised to be stored therein, while Appendices F., G., H., I. group the gunpowder, dynamite, lithofracteur and gun-cotton magazines according to the amounts which they are licensed to contain.

Gunpowder magazines under Continuing Certificates.

Comparing these Appendices with the corresponding tables in last year's Report, it will be observed that the alterations in gunpowder magazines under Continuing Certificates, which now number one hundred and fifty-seven (Appendix F.), consist in the removal of one 5–10 ton magazine (No. 199), three of 10–25 ton (Nos. 98, 156, 180), one of 25–50 tons (No. 71) and one of over 100 tons (No. 182) from the list, for the following reasons:

The Continuing Certificates of three (Nos. 98, 180, and 182) were surrendered; one (No. 156) lapsed through continued disuse under section 13; one (No. 199) became a store; and one (71) was abandoned.

Dynamite and lithofracteur magazines under Continuing Certificates.

In the case of dynamite and lithofracteur magazines under Continuing Certificates, which now number twenty-three (Appendix G.), three magazines under 2 tons (Nos. 129, 185, 189), two of 2 to 5 tons (Nos. 59 and 157), and one of 5 to 10 tons (No. 101) have been removed from our list, on the following grounds:—

In the case of three (Nos. 101, 157, and 185) the Continuing Certificates have been surrendered; two magazines (Nos. 59 and 129) have been pulled down; and one (No. 189) has become extinct from continued disuse, under section 13. In the case of nearly all

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* The number actually in use is 291,—the following having given notice, under section 13, of temporary disuse, viz., Nos. 97, 128, 229, 264.

In addition, there exists on our books a magazine in Erith Marshes (No. 200) established by this Department in conjunction with the Metropolitan and City Police for the deposit of seized explosives. This magazine is, however, exempt from the operations of the Act under section 97, and is not included by us in the list of magazines.

† The number actually in work at the present time is 180,—the following having given notice, under section 13, of temporary disuse, Nos. 97, 128.

‡ The number actually in work at the present time is 111,—the following having given notice, under section 13, of temporary disuse, viz. Nos. 229, 264.

dynamite magazines under Continuing Certificates, blasting gelatine has, by Amending License, been added to the list of explosives authorized to be stored therein.

In regard to gunpowder magazines under License (including those in which ammunition of certain sorts may also be kept), and which now number seventy (Appendix H.), the changes have been as follows :— Gunpowder magazines under License.

	Increase in No.
Magazines containing not exceeding 2 tons - - -	7
„ over 2 tons and not exceeding 5 tons - -	7
„ „ 5 „ 10 „ - -	3
„ „ 10 „ 25 „ - -	1
„ „ 25 „ 50 „ - -	1
„ „ 50 „ 100 „ - -	1
	20

In regard to magazines for dynamite, blasting gelatine, and lithofracteur under License, which now number twenty-seven (Appendix I.), the changes have been as follows :— Magazines for dynamite, blasting gelatine, and lithofracteur under License.

	Total change Net.
Magazines containing not exceeding 2 tons - - { Reduction 1, Increase 2 }	Increase 1
„ over 2 tons and not exceeding 5 tons - { Reduction 1, Increase 3 }	Increase 2
„ „ 5 „ 10 „ - -	„ 1
„ „ 10 „ 25 „ - - -	„ 3
Total increase - -	7

In regard to guncotton, &c. magazines under License, which now number four (Appendix I.), there has been no change. Guncotton, &c. magazines under License.

The number of applications for magazine licenses during the year was thirty-two (of which three were withdrawn), and there were forty-six outstanding from the previous year (of which sixteen have been withdrawn). Of the remainder, thirty-four have been confirmed. Appendix K. gives the details as to the new and outstanding applications, and the progress made therewith. It will be observed that out of the thirty-two applications made during the year (of which three were withdrawn) there was no instance of rejection. Three out of the outstanding applications were rejected. Applications for magazine licenses.

In our last year's Report we discussed a case in which the local authority had refused their assent to a draft magazine license granted by the Secretary of State, on the ground that the applicant would be unable to satisfy the conditions imposed by the draft license, and we then stated our opinion that a refusal based on these grounds proceeded upon an imperfect conception of the proper functions of the local authority in regard to assenting to the establishment of a factory or magazine.

This case formed, during the past year, the subject of an appeal to the Secretary of State, by whom the objections of the local authority were ultimately set aside, and the license prayed for was duly confirmed (Magazine No. 305). We are not aware of any case during the year of the local authority dissenting from the establishment of a magazine on a site indicated by a draft license granted by the Secretary of State.

No less than forty-four amending magazine licences have been applied for during the year, and one was outstanding from last year. Of these forty-five applications one was rejected, two were withdrawn, and forty have received confirmation. (*See* Appendix L.) The larger proportion of these amending licences were granted in connection with the addition of the new explosive blasting gelatine to the explosives authorised to be kept in dynamite magazines.

In other instances the necessity for an amending license has (as in the case of factories) frequently resulted from carelessness of the licensee in preparing his original application, whereby some omission or error required to be rectified.

Of the magazines generally, we are able to state, as we have already stated with regard to factories, that the condition shows marked improvement. In two instances only did we find it necessary actually to have recourse to legal proceedings in connection with magazines; but in a considerable number of other cases it became our duty to place explosive under seizure and detention until certain observed illegalities had been rectified. But the standard, we may say, has now generally been so far raised that a magazine which a few years ago General condition of existing magazines.

would have passed unnoticed, and even been considered, as magazines then were, fairly good, now often falls below the average, while the new magazines which have been erected since the Explosives Act came into operation are most of them of most excellent construction.

Magazine keepers now frequently appear to take a real pride in the cleanliness and general condition of the magazines under their charge, and it would be possible for us to specify large numbers of magazines which really leave nothing to be desired. As regards the old magazines under Continuing Certificate, while many of them are of thoroughly satisfactory construction, and while in nearly all of them the original defective details have by this time been mostly corrected, there remains the objection with regard to some of them that their situation is dangerously unsatisfactory. As we have before pointed out, however, this is a matter as to which this Department has no voice. We have to accept the situation and make the best of it*, and insist upon such internal improvements as may be practicable to increase the safety of the magazine. And there is some satisfaction in reflecting that, as pointed out in our last year's Report, the number of such magazines must gradually diminish, from the running out of the lease, the shifting of the centres of trade, and other causes.†

As a matter of fact, as many as twelve such magazines have disappeared during 1878, being a proportion of over 6 per cent. on the 194 certificated magazines which existed at the commencement of last year.

On the other hand, all new magazines will be subject to all the requirements of the Act as regards isolation from protected works and suitable constructive details. Appendix M. gives the distribution of magazines throughout the country.

Stores.

Stores.—Of "stores" (*i.e.* magazines licensed by the local authority for quantities of explosive, not exceeding 4,000 lbs. of gunpowder, or half that amount of dynamite, guncotton, and the like,) we have been unable in former Reports to furnish any statistical information, because we have not had returns from the local authorities of the number of such places licensed by them. During the past year, however, an attempt has been made by us to obtain from the various local authorities throughout the kingdom returns of all stores licensed by them, and in existence on the 1st April 1878. Owing to the negligence of many of the local authorities, and the ignorance on the part of others of the most elementary points connected with the Act, the labour involved in getting in this return has been almost incredibly heavy,—a point to which we shall more particularly refer hereafter,—while this return can neither be regarded as complete or correct. It is not complete, because even at the present time, nine months after the return was called for, there remain a few local authorities who have not responded to the numerous circulars which have been sent to them. The return is not correct, because in a number of cases the local authorities have evidently returned as stores, places which should be returned as registered premises, and have licensed as stores places which are not entitled to a license of this sort; while in those districts where the Act is not yet efficiently worked, there is little doubt that places exist, which, under a more satisfactory state of things, would be brought within the operation of the Act under the head of "Stores," and in other instances licenses have been allowed to expire, and have not been renewed.

But taking the returns, so far as they go, for what they are worth, it appears that there were in the United Kingdom on 1st April 1878 the following number of stores :—

	Under Continuing Certificate.	Under License.	Total.
England and Wales - -	508	1,062	1,570
Scotland - - -	48	250	298
Ireland - - - -	6	99	105
	562	1,411	1,973

The detailed distribution of these stores in counties is shown in Appendix N.

Of the condition of these stores as a whole it is impossible for us to speak with the same confidence as we are able to do in the case of magazines, because, as we have explained in former Reports‡, this Department makes no pretence of undertaking the active supervision of stores, the duty of inspecting these being vested by the Act primarily in the local authorities, a right of entry and a power of general control being left to the Government Inspectors. Accordingly, we have during the past year followed the same course which we have adopted before, viz. visited a few stores in various districts as samples of the district, and as incidental to our other inspectorial work. In this way we have during the year inspected

* Report for 1877, p. 12. † Ibid., p. 12. ‡ Report for 1876, p. 9; Report for 1877, p. 13.

210 stores in different parts of the country, and the result has been to show a generally marked improvement In some places this has been very striking. Thus, in the course of the autumn we visited the whole of the stores in the Cleveland district, and the state of these was, with few exceptions in regard to some minor matters, generally most satisfactory. A few years ago, a well-constructed, well-conducted store or magazine was an exception in this district, and some of the prevailing practices were curiously dangerous. Now the reverse holds good. The stores are for the most part nicely built, wood lined, kept clean, and exclusively appropriated to the storage of explosives, and provided with proper boots, and generally with suitable rules. A capital example of the useful operation of the Act is also afforded by the marked improvement which has been effected in the Northwich Salt Mining district. The stores hereabouts were shockingly neglected when we inspected them in 1877. The deficiencies have for the most part been liberally corrected, and good stores take the place of bad ones. In our last year's Report* we mentioned the case of a store, where in our presence the storekeeper dropped a lucifer match on to the powder-strewn brick floor while we were inspecting the place. This store has been replaced by one which appears to be well constructed and well managed in every way.

Other districts could be cited where the operation of the Act has been not less beneficial; and it is to us a matter of the greatest satisfaction to note, as we proceed from one part of the country to another, the general elevation of the standard of precautions which has been effected, and how the old idea that any place was good enough to put gunpowder into, and that explosives generally were longsuffering inert bodies with which almost any liberties might be taken short of the direct application of a red-hot poker, is yielding to a more intelligent appreciation of the risks attaching to the storage of these substances, and how store-owners and store-keepers now often cite with horror examples of the dangerous practices which prevailed a few years ago, and respond cheerfully to suggestions for the safer conduct of their business. It is much to be regretted, however, that the establishment of this feeling, and its fruition in the substitution of good stores for bad, is not universal; and the responsibility of those local authorities to whose inaction the absence of results is due is surely very heavy.

The condition of the stores of any given district may be taken as a rough but not unreliable index of the vigilance or the inaction of the local authorities of that district. Where there is a local officer appointed, where that officer regards his duty as something more than a form, and makes his inspections a reality, the results of the Act in promoting the increased safety of the workpeople and the public are, we do not hesitate to say, nearly all that could have been anticipated. But it is not to be expected that where the local authority show no disposition to enforce the Act, and the people consequently remain in their original ignorance as to the regulations and risks, any marked improvement should be observable. In such cases the law remains a dead letter, and it is highly discreditable to the local authorities concerned that it should be so. We shall have more to say on this subject hereafter.

As illustrative of the advantages of inspection and the evils of non-inspection, we may mention a case which came under our notice in the Frodingham Iron District.

At one of the works there, owing to an inspection which we had made in 1875, a most excellent store had been constructed. But this store had never been visited by the officer of the local authority, nor had a store in some adjoining works not previously inspected by us, and we consequently found, on visiting the latter this year, a most discreditable state of things, including a store-keeper with matches in his pockets. We deemed it necessary in this instance to seize the powder. Probably a single visit from the officer of the local authority would have rectified this, and it ought not to have been left to the Government Inspector to bring all this to light.

In some of the more flagrant cases of the neglectful management of stores which have come under our notice, or when the authorised amount was deliberately exceeded, we have effected seizures of the explosive, and have called upon the local authority to institute proceedings against the offenders. (*See* Appendix T.) In other instances the officers of the local authority, when their attention has been called to illegalities, have themselves moved in the matter.

There has been an instance during the year of the destruction of a store by lightning (*see* Appendix W. Index No. 45). The store was situated at the Messrs. Haigh's Victoria Colliery, Bruntcliffe, and contained 2,000 lbs. of gunpowder. The circumstances of the accident, and the conclusion to be drawn therefrom, are very fully dealt with in a Special Report on the accident, dated 17th September 1878. H.O. 76376.

* Report for 1877, pp. 13, 14.

Registered premises.

Registered Premises.—According to the returns which have been furnished by the local authorities during the year, (returns which, however, as in the case of stores, are incomplete, and often incorrect)*, the number of registered premises in the kingdom is as follows:

England and Wales - - - -	11,396
Scotland - - - - -	1,220
Ireland - - - - -	530
	13,146

(For distribution in counties, *see* Appendix N.)

It is impossible to doubt that the number ought to be very much larger than this, and we anticipate that the next return, when we hope the working of the Act by the local authorities generally will have become more complete, will show a considerable addition to these numbers; but they illustrate quite sufficiently a point on which we have before more than once insisted, viz., the impracticability of this Department pretending to undertake anything like a controlling supervision and inspection of these premises. The 38 registered premises which we visited during the year is a drop in the ocean. We cannot really do more than urge the local authorities to discharge the duties which the Act imposes upon them, and continue to impress upon them that unless registration be followed up by inspection the object of such inspection is entirely neutralized. Indeed, we have constantly insisted upon the distinctly injurious effect which the non-enforcement of the Act has upon the legal trader,—a point upon which we shall have some observations to offer in another part of our Report.

As regards the system of registration, and the application to registered premises of the statutory regulations, we see no grounds for expressing anything but satisfaction. When the Act is really worked, it works well. The device of bringing a trader under observation by means of registration is a very simple one, and as little irksome to the traders as it is possible to make it; while the regulations which are applicable to registered premises appear to have been generally accepted as reasonable and free from objection on the score of inconvenient restrictiveness.

Breaking bulk on retail premises.

We are unaware of any part of the regulations applicable to registered premises in the enforcement of which any substantial difficulty has arisen, except perhaps in regard to the non-breaking bulk on such premises. The habit of taking powder from an open barrel underneath the shop counter, and doing it up into parcels for retail sale, has in some districts become so confirmed that the officers of the local authorities have had some difficulty in persuading traders that the present Act contained provisions designed to prohibit it. And a further complication has arisen from the traders being able occasionally to point to an adjoining district where (owing to the apathy and inaction of the local authority) the practice still flourishes without let or hindrance. We hope, however, that it is now beginning to be more generally understood by retailers that breaking bulk on their premises is contrary to the Act; and that the simple solution of the difficulty is to require the manufacturers to supply the explosive made up in suitable packages. The manufacturers are for the most part quite prepared to meet such a demand; and it only rests with the local authorities by the action of their officers to cause the entire disappearance of the dangerous and illegal practice of opening on retail premises casks of gunpowder for sale in small quantities. During the year three cases of accidents arising from the presence of exposed explosive in a shop have arisen. (Appendix W. Index Nos. 3, 70, and 71.)

In one instance (No. 3) a life was sacrificed.

Exposure of fireworks in shop windows.

The practice of exposing fireworks in shop windows appears to be becoming less common, and the supply of dummies for this purpose is now a recognized part of the wholesale firework-makers trade. There is no reason whatever, except the carelessness of the local authorities, why this practice should exist at all.

III.

Packing and Conveyance of Explosives.

Packing and conveyance of explosives.

As usual, we have, as far as lay in our power, watched the working of the Act in regard to these important points, with a sense of anxious responsibility, there being scarcely any part of the Act which so largely affects the interests of public safety.

Packages.

With the exception, we believe, of one firm, which still employs single packages of a special construction for quantities of gunpowder of 25 lbs. and under, the gunpowder trade generally have had recourse to double packages for all except the very small parcels.

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* See p. 10.

We receive constant testimony of the practical value of this improvement. The following case is illustrative of this point:—At a magazine at Goginan (Cardiganshire) we found, in October last, two broken casks of gunpowder. One of these, a "quarter" (*i.e.* 25 lb.) cask, had become disfigured in transport, and the head had been forced in; but, owing to the powder being contained in an internal bag, not a grain of it had escaped.* Side by side with this cask stood a "whole" (*i.e.* 100 lb.) cask, without any internal bag, being a portion, as we subsequently ascertained, of an old stock. The head had become broken in transport, about 15 lbs. had escaped into the cart, whence it had been swept up by the young man who had charge of the magazine, and placed in another barrel in the magazine, and we found on examining it that it was mixed with no inconsiderable quantity of flinty grit, gathered up with it from the cart. We immediately caused this mixture of powder and grit to be destroyed. But it is obvious that in this case, owing to the absence of a bag, two risks of no inconsiderable character had been established;—because, first, had there been a hole in the cart, the escaping powder might (as in the case of the Great Eisenach Explosion of 1810, and in a more recent instance which occurred in the Loch Fyne gunpowder factory in 1877) have easily led to the explosion of the whole consignment; and, second, the presence in a magazine of a mixture of powder and flint can hardly be regarded as conducive to its safety.

A not less valuable example of the importance of providing thoroughly sound packages from which no particle of explosive can escape is afforded by a circumstance which happened in the Thames during the year. While a quantity of gunpowder was being stowed in the magazine of the ship "Selina" of Leith, one of the workmen trod on a lucifer match, which immediately ignited. Had this happened in a magazine in which there had been a single leaky barrel, such as before the present Act came into force not unfrequently existed, the consequences might have been most disastrous.

These circumstances illustrate usefully another point as to which some difference of opinion at one time existed between this Department and the trade, viz., the expediency or necessity of enforcing the package regulations with the same strictness in regard to powder designed for exportation as for home consumption. Obviously, a risk of this sort arising in British waters is not less formidable because the powder happens to be destined for a foreign port. Indeed, it is so obvious that the necessity for safe packages continues so long as the powder remains within the United Kingdom, whether on shore or afloat, and without reference to its ultimate destination, that we should scarcely have thought the point worthy of special notice, had it not been that some manufacturers, pressed by the exigencies of competition in foreign markets, had at one time urged upon us, and with apparent seriousness, the opposite view.

In the case in question it is probable that the match had been dropped by one of the sailors or by a workman engaged in preparing the place for the stowage of explosive. The officers of the Thames Conservancy have been directed to exercise the greatest vigilance to prevent the recurrence of such a risk for the future.

The generally improved condition of the barrels is fully recognised by the officers of vessels engaged in carrying explosives, who are sensible of a large accession of safety in consequence.

It is satisfactory to be able to record that a captain of a ship which was in the habit of conveying gunpowder observed to one of the manufacturers not long ago, "I can't think "what has come to your casks; I never see such a thing as a leaky one now, and formerly I "never went a voyage without one."

The wooden box with bag inside seems to be gaining ground in some districts, and, if made of properly seasoned stout wood, fulfils all the requirements of a satisfactory package.

The packing of explosives other than gunpowder appears to call for no particular remark except that we have had during the year some ground for congratulating ourselves that we have insisted upon the improved method of packing detonators referred to in our last Annual Report.† On the whole we consider that the very important subject of the safe packing of explosives may now be regarded as having been placed upon a reasonably satisfactory footing.

Conveyance of explosives.

Carriage by road.

The important matter of the carriage of explosives on roads is one which, from its very nature, and from its being primarily and necessarily under the control of the local authorities, is to us somewhat intangible. We have not during the year had any specific instance brought under our notice of illegal or dangerous conveyance on roads; but our local inquiries lead us to believe that, owing to the comparative inaction of the local authorities and their officers in a matter which is peculiarly their own, the public are very far as yet from reaping

* This is by no means the only case in which we have found the escape of powder from a broken barrel averted by the presence of a bag.

† See Report for 1877, p. 18.

the full amount of protection which the provisions of the Act affecting road carriage are designed to afford. On the other hand, we have no reason to believe that the provisions are such as the traders and carriers generally would find any difficulty in fully conforming to, were they to see that the local authorities were in earnest as to their enforcement. No doubt, if at some future time an explosion from the neglect of the regulations should occur in the transport of explosives through a town or village, the rein will be pulled up tightly enough; but it is not satisfactory to be under the necessity of believing there are some local authorities who can hardly be roused to a sense of their duty by anything short of a disaster of this description.

Carriage by canal.

The code of byelaws for canals which was approved by the Board of Trade in 1876, and which was given in our Annual Report for that year,* is still in force, and we have seen no reason for suggesting any alteration in the same. During the year seven more canals have adopted this code, making, with the ninety-five canals which had previously adopted it, one hundred and two canals working under these regulations. The number of canals which have given notice that they do not carry explosives has received no accession since 1876, and still stands at eleven. (For details as to the canals carrying and not carrying explosives, see Appendix O.)

Conveyance by rail.

In respect of railways, also, the code of byelaws adopted in 1876 and given in our Report for that year, has continued unaltered.† Three more railways have adopted this code during the year, making, with the eighty railways which had previously adopted it, eighty-three railways which are working under this code. One railway (the Preston and Wyre) has given notice that it will not carry explosives. The total number of railways which have given a prohibitory notice up to the present time is eight. (For details as to the railways carrying and not carrying explosives, see Appendix P.)

Harbours.

At the date of our last Report there were two hundred and two harbours provided for, of which fifty had no trade in explosives, or had prohibited under former Acts, and fifty-one had prohibited under the Explosives Act. During the past year byelaws regulating the general traffic have been approved for nineteen additional harbours, making ninety-seven harbours thus provided for; while seven more harbours have prohibited the traffic, making fifty-eight harbours so prohibiting.

The number of harbours where there is no traffic in explosives now stands at forty-nine, being a diminution of one.‡ The number of harbours with a limited traffic still remains at twenty-three; thus a total of two hundred and twenty-seven harbours is provided for in one way or another. This number comprehends nearly the whole of the harbours of importance. (For details, see Appendix Q.)

The following table shows in a synoptical form the condition of the railways, canals, and harbours in regard to the making of byelaws, and we may claim for these figures that they sufficiently dispose of the apprehension which was at one time expressed that one effect of the Act would be to close a great part of the railways, canals, and harbours of the kingdom against explosives.

	No. of Companies and Harbours which have made byelaws regulating the traffic in Explosives.			No. of Companies and Harbours which have notified that they either will not admit a traffic in Explosives or have no such traffic.		
	Railways.	Canals.	Harbours.	Railways.	Canals.	Harbours.
England	57	89	60	8	9	34
Scotland	9	4	22	—	1	55
Ireland	17	9	38	—	1	18
Total	83	102	120*	8	11	107

* Of these, 23 limit the traffic to 30 lbs.

IV.

Importation.

Importation.

The importation of explosives§ into this country has hitherto been inconsiderable. The licenses to import have included blasting gelatine, lithofracteur, and fulminate of mercury from the Channel Islands, detonators from Germany, electro-detonator fuzes, and instantaneous

* See Annual Report for 1876, pp. 31, 32. † See Annual Report for 1876, pp. 33, 35.

‡ This is because Barrow Docks is now included with Barrow Harbour.

§ No explosives, other than gunpowder, cartridges made with gunpowder, explosives of the 1st division of the 6th (Ammunition) class, and fireworks, may be imported without a license. (Section 40 (9), and Order in Council No. 10.)

blasting fuze; but of these articles we believe that only lithofracteur, detonators, and fulminate of mercury have been actually imported during the year, and in the case of lithofracteur the amount introduced has not been great. The manufacture of detonators in this country, which is now licensed to be carried on in four different factories (Nos. 7, 18, 46, 68), and is in active progress at least in two of these, must gradually materially affect the importation trade in these substances. (Appendix R. shows the number of applications for importation licenses and renewals during the year. For details as to the nature of explosives for the importation of which licenses have been granted, see Appendix S.) The rule which we found it necessary to lay down, to refuse applications for importation licenses into any harbour for which no bye-laws regulating the general traffic in explosives have been made under the Act, occasioned some difficulty in the earlier days of the Act.* Now that the number of harbours for which such byelaws have been made amounts, as we have shown, to ninety-seven, little or no practical inconvenience results from the arrangement. But in any case, it is a regulation which, in the interests of public safety, it would be inexpedient to dispense with; for if foreign manufacturers thought they could safely introduce cargoes of explosives into ports where no supervision or regulations exist, the danger would not be confined to the particular harbours where such importations were effected, and where of course it might assume alarming dimensions, but might, in the case of the chemical explosives, the thorough purification of which constitutes a first element of safety, extend all over the country; and a cargo of impure dynamite, once distributed, would be in the highest degree difficult to get together again and remove when its real nature came to be ascertained.

Necessity for refusing importation licences for harbours for which bye-laws regulating the general traffic in explosives have not been made.

In consequence of some instances which came under our notice, in which cases containing imported explosives which had been opened by the Custom-house officers for inspection, had been despatched to their destinations without being properly re-packed and re-secured, we deemed it necessary to advise (H.O. $\frac{15848}{646}$) that an alteration should be made in the terms of the importation licenses, whereby the duty of opening and re-packing any cases which the Customs officers might desire to have opened for inspection was distinctly fixed upon the licensee, and a circular letter was addressed to the various licensees drawing their particular attention to the fact that the responsibility for such carefully re-packing is theirs, and does not attach to the Customs officers, who are entitled to require any case to be opened, but are not themselves charged with the duty of opening or closing the same. The clause which was inserted in the importation licenses to meet this case runs as follows:

Opening cases of explosive for inspection by Customs officers and closing the same.

> "5. The licensee, and the owner and master of any ship or boat in which any explosive is being imported in virtue of this license, shall, when required by a Government inspector or by any officer appointed by the local authority, or by any officer of the Commissioners of Customs, produce to him this license, or a properly certified copy of the same, and furnish such inspector or officer with the means necessary to enable him to ascertain whether the conditions of the same are complied with; and shall, when required by any inspector or officer as aforesaid, open or cause to be opened any case or package imported under this license for the purpose of examination or for the taking of samples by such inspector or officer, and shall re-pack, or cause to be re-packed, every case so opened, using all care and precautions in the opening and re-packing of the same, for the prevention of accidents."

In the covering letter which accompanies each importation license a paragraph is added calling particular attention to the obligation of exercising care and caution in such opening and closing of the cases as may be necessary.

V.

Inspection and Search.

Inspection and search.

We have seen no reason for modifying the opinions expressed in our former Reports that the powers conferred on Government Inspectors by section 55, coupled with the powers of search and seizure conferred by sections 73, 74, and 75, are ample and satisfactory.

Appendix T. shows the various cases in which we have found it necessary to recommend or procure the institution of proceedings, and gives details. We have endeavoured to avoid instituting proceedings, except in cases of a gross and flagrant character, or when some element of wilful disregard of the law or culpable carelessness presented itself. We are pleased to be able to report that in only sixteen cases has it been found necessary actually to go into Court, and of these five cases were handed down from the year before. In five out of the sixteen cases the proceedings were actually taken by the officers of the local authority at our instance.

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* See Annual Report for 1876, p. 16.

In a considerable number of cases we felt it necessary to place explosive under detention, with a view to securing the prompt and complete rectification of causes of complaint; but, except in the instances in which proceedings were actually taken, the seized explosive was released on this Department being satisfied, by the production of a certificate or otherwise, that the necessary alterations had been completed within the assigned limit of time.

In some of these cases we have doubted very much whether we ought not to have pressed the matter to a conviction, but our desire to bring the law into effective operation with as little recourse to direct coercion as might be practicable has prevailed, except in the cases named, to secure for the offenders the benefit of the doubt.

In all the cases which were tried convictions were obtained. The penalties inflicted (exclusive of forfeiture) amounted to 273*l.* 2*s.* 0¼*d.*, and the costs* to 29*l.* 19*s.* 0*d.*

Extent of work accomplished during the year.

The nature and amount of work in the way of inspections and other visits which we have accomplished during the year is given in Appendix U.

The extent of ground covered by us in our various visits can perhaps be most conveniently indicated by an enumeration of the different counties in which our work has been carried on, and such an enumeration is given in Appendix V.

It will be seen that,

Of the 52 counties	in	England and Wales,	we have visited	38
„ 33	„	Scotland	„	9
„ 32	„	Ireland	„	12

making a total out of the 117 counties in the United Kingdom of - 59 in which we have made inspections and paid visits of various sorts during the year 1878.†

Appendix V1 enumerates the various boroughs which we have personally visited since the Act came into force.

It will be observed from Appendix U. that the total number of visits of all sorts during the year has amounted to 800. In 1877 this figure stood at 993. The decrease is mainly due to the following causes :—

1st. To the considerable reduction in the number of visits to local authorities for the purpose of inspecting registers and obtaining information as to the working of the Act in their several districts. The number of such visits has amounted to 99 only, as compared with 241 in 1877, and this is due in a great degree to the fact that the circular of 15th February 1878, to which we shall hereafter more particularly advert, and which called on local authorities to send in copies of their registers, has in a great degree superseded the necessity for visits to the offices of the various clerks.

2nd. The number of magazines visited by us during the year is 142, as against 215 in 1877,—a result which is in a great degree attributable to the fact that in 1877 we made a special effort towards the close of the year to inspect every magazine then on our books, and the time at our disposal did not admit of our repeating this effort in 1878, even had it seemed to us desirable or practicable to put other work on one side for this purpose.

3rd. There is a considerable decrease in the number of visits "to places not classed," viz., 46 against 117, and this is so far gratifying that it shows that such places are not found by us in our inspections to be as numerous as they were, but have been in great measure placed upon a legal footing and absorbed as factories, magazines, stores, or registered premises, or have ceased to exist.

4th. We have during 1878 devoted more time to the inspection of factories than in former years, and the inspection of a factory is generally commensurate, in point of time actually occupied, with many of those smaller visits which go to swell the total of work performed. There are factories which it is impossible to inspect thoroughly under four or five hours, or even longer; and the amount of work involved in the inspection of the 80 factories which we have been able to visit during the year has been far more considerable than would be supposed by any one unacquainted with its character.

The inquiries into accidents occupy a great deal of time, and often involve distant travelling; the same may be said of our attendance at inquests; while the amount of correspondence involved in obtaining particulars of the 104 accidents on our books (see Appendix W.) has greatly exceeded our former experience.

The number of stores visited has again been large (210). Indeed, having regard to the time at our disposal for other duties, it is larger than we should wish, or than would be necessary if the local authorities could be generally relied upon to discharge the duties imposed upon them by

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* The costs were not stated in all cases.

† Several counties in the United Kingdom which are purely agricultural have little or no trade in explosives.

the Act. By visiting stores in various districts, we obtain samples, so to speak, of the work performed by the local authorities in their several districts, and some measure of the extent to which the Act is being worked by them. Whether we shall ever be able to look forward to a time when the Government inspectors will not be required to do work which it is the duty of the local authorities to perform, and will be able with confidence to leave the inspection of stores to their officers, we do not know; but it is quite certain that that time has not come yet; and so, although the time occupied in inspecting some two hundred stores each year is a very serious tax upon us, we believe that it is well spent, if, as in the majority of cases, it leads to the more effective inspection of a large number of other stores, and places the working of the Act by the local authority upon a generally more satisfactory footing. And this result, we believe, our visits to stores here and there over the country tends to accomplish,—

1st. By encouraging those officers of the local authorities who have endeavoured conscientiously to carry out the Act.

2nd. By bringing under notice existing, or it may be typical, defects.

There has, however, during the year 1878 been a special inroad upon the time at our disposal in connection with the return called for from the various local authorities on the 15th February. (Appendices N, W1.)

It will be preferable to reserve our detailed observations on this return for the next section of our Report, and we will merely now remark that, owing to the carelessness of a very large proportion of the local authorities, the persistent neglect of others, and the necessity for many hundreds of circular reminders, and between nine hundred and a thousand letters of explanation, exhortation, and correction, the getting in of this simple return has proved a work of enormous labour, and our office duties during the year just closed have in consequence attained abnormal proportions.

Had it not been for the exceptional labour entailed in the getting in of this return, we should have had far more time at our disposal for the carrying out of inspections, and we certainly grudge time which we feel has been wasted solely because of the neglectful manner in which so many of the local authorities discharge their duties.

The current office work has otherwise happily been lighter than in former years, and as the working of the Act proceeds more smoothly may be expected to become lighter still. We can hardly anticipate that the labour of getting in a return from the local authorities can ever again attain such formidable proportions as it has assumed on this the first occasion; and we trust, therefore, that the time is not far distant when the administration of the Act will cease to put, as it has hitherto done, a strain upon every one connected with the Department which could not be permanently sustained, and the continuance of which would oblige us, however reluctantly, to ask for further assistance.

VI.

Working of Act by Local Authority.

Defective working of Act by local authority constitutes its weak point.

We regret that we are unable to qualify the opinion which we have expressed in former Reports that a seriously weak point in the working of the Act is the inaction and neglect of a large proportion of the local authorities. But this feature has, during the past year, acquired especial prominence in connection with the return which was called for, and to which reference has before been made, of the number of licences granted by, and places registered with the local authorities, together with the names of the officers appointed by them to carry out the Act. This circular, of which a copy is given in Appendix W1, was issued on the 15th February, and required the returns, which were to relate to the state of things existing on the 1st of April, to be rendered not later than the 15th April. The requisition was made in virtue of the powers vested in the Secretary of State under the 28th section of the Act.

Return of places licensed by and registered with the local authority.

Difficulties experienced in procuring the return.

From the very first issue of this circular up to the present time, the labour and difficulties connected with it have been unceasing, while the extraordinary and total ignorance of their duties, and of even the most elementary provisions of the Act, displayed by many of the clerks to the various authorities, surpassed our most unfavourable anticipations. No sooner had the circular been issued, than some clerks began to send in returns relating to periods preceding that to which it applied. In one case, a clerk to a petty sessional division returned among the "store licences" three which he said had been granted in 1875, or before the Act came into force. It soon became apparent that the registers of many local authorities must be in total confusion, and that too often no distinction was drawn by them between stores and registered premises.

Many clerks returned a list of "stores" situated in places where it was clear no "stores" could be lawfully established on account of the proximity of protected works. For

example, without particularizing places where this confusion has existed, we may state that some town clerks have returned a number of "stores" in the High Street or Market Street of the boroughs where they had jurisdiction. On inquiry, it of course turned out that these should really all have been merely registered premises, and returned as such. The store licenses granted in these cases were all invalid. Again, although it is expressly stated in the Act that Continuing Certificates for stores can be granted only for places formerly established (under the 19th section of the old Gunpowder Act) for the exclusive use of a mine, quarry, colliery, or factory of safety fuze, and near to the same, and not within one mile of a borough or market town, or half a mile of any parish church, or 200 yards of a dwelling-house, many returns have been rendered of Continuing Certificates granted for the stores of ordinary dealers situated in the heart of a borough or market town. In a very large proportion of cases, the same places have been returned both as stores and registered premises; in some instances, the same place has appeared three times over, as a store under Continuing Certificate, a store under License, and registered premises. Then, the returns constantly fail to show whether the licenses or registrations have been renewed; and in some cases, on the other hand, Continuing Certificates, which do not require to be renewed, have been shown as renewed. It has not uncommonly happened that licenses for petroleum (which is not an explosive at all, and is regulated by a totally different Act,) have been included in the returns; while some clerks have sent in lists of people licensed to sell fireworks, although such licenses were dispensed with three years ago, on the coming into operation of the Explosives Act, 1875. Factories and magazines licensed by the Secretary of State have occasionally been returned as premises registered by the local authority; and in Ireland, licenses to bear arms, granted under the Peace Preservation Act, have been returned. In short, almost every conceivable variety of blunder finds a place in the returns which have reached us. After the very great exertions which have been made by us to assist and instruct the local authorities in the discharge of their duties, it has been a great discouragement to us to find so much confusion existing in their minds on the simplest points connected with these duties.

Passing from the clerks who have made some sort of return, we arrive at a group who have either made no return at all, or have unduly delayed, or have thrown difficulties in the way of rendering the returns. And this group is, we regret to say, a very large one. Thus, shortly after the circular was issued, clerks began to write to ask for blank *forms* of returns; whereas, had they consulted the Act, they must have seen that as the registers (except in Ireland) are to be "in such form" as the local authority may direct, and as the returns were to be copies of these registers, it was wholly impossible for this Department, in the absence of information as to the forms of registers actually adopted, to furnish the forms asked for. We believe we are within the mark when we say that hardly two-thirds of the returns contained any information as to the officer (if any) appointed by the local authority, thus entailing a second letter of inquiry; while a very large proportion of the returns were incomplete, as they enumerated so many stores or registered premises, but failed to state if, as regards the other points, the return was *nil*. In these cases also a second letter was necessary. After two months had elapsed from the date at which the return was originally due, we found that out of about 2,300 local authorities to whom the circular had been sent there still remained over 800 who had vouchsafed to it no reply. Accordingly, on the 15th June a reminder was sent out to the defaulting local authorities. This had the effect of bringing in a considerable number of returns, containing about the same proportion of defects as above, and entailing the writing of an immense number of letters. At the end of another two months, viz., on the 15th August, there still remained over 300 local authorities who had not replied. To these a second reminder was sent. In addition to the above, reminders have been sent direct by ourselves in a large number of cases; and in as many as 30 cases, including four boroughs (those of Lichfield, Stafford, Ipswich, and Huddersfield), no less than five copies of the original circular had to be sent before a reply of any sort could be obtained, and the replies ultimately received were, in some instances, not worth the paper they were written upon.

In eleven cases no return could be obtained until a letter had been addressed to the clerk intimating that the Secretary of State would place the matter in the hands of the Solicitor to the Treasury with a view to proceedings unless the return was sent in by a certain date; and in the case of one town clerk it was found necessary actually to commence proceedings, which were ultimately foregone on his paying the costs incurred by the Solicitor to the Treasury. There is still one case in which proceedings are outstanding, and in the case of an Irish Petty Sessional Division the clerk has been dismissed. Up to the present time returns have been received from 2,239 local authorities.* We have recited in some detail the circumstances attending the getting in of these returns for the following reasons:—

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* The attempt to get the return from some of the small harbours (where doubtless it would be "nil") has not been persevered with.

1st. Because we doubt if it could be credited that the calling from public officers of so simple a return as a copy of the registers kept by them under the Act, and the name of their inspecting officers, would have entailed so much difficulty, and occupied so much of the public time. Probably in most instances ten minutes or a quarter of an hour would have sufficed to enable the clerks to make out the return; and yet, as we have seen, they preferred, even in cases where, owing to the return being "nil," it would probably not have occupied more than a couple of minutes to make out, to put a public department to the trouble of sending them circular after circular, and even to expose themselves to the penalties of prosecution.

As illustrating the sort of spirit in which in some instances the performance of this simple statutory duty has been performed, we may mention that one of the town clerks, whom it had been found impossible to move except by a plain intimation that further delay would entail prosecution, observed to us in conversation (the confused and defective character of the return ultimately rendered by him having rendered necessary a personal visit) that he "generally let the Local Government Board send him three letters before he troubled himself to reply."

2nd. The condition of things disclosed confirms only too plainly the opinions which we have before expressed as to the inaction and apathy of many of the local authorities constituting a real practical weakness in the operation of the Act. If in so small a matter as the rendering of a single and very simple return the local authorities prove in a very large number of cases thus careless or incompetent, what result is to be expected when we look to them for the vigilant enforcement of the Act, and for that active supervision which alone can efficiently secure the public safety?

3rd. Our experience in this matter raises a serious question as to whether it will ever be possible, with the existing local authorities, and in the absence of more direct Government interference, to secure such an administration of the Act as will afford to the public the degree of security, and to the trade the uniform incidence of protective regulations, which are necessary in the interests of both alike.

4th. In the absence of such details as we have afforded, it could hardly be understood to what an extent the getting in of this return has constituted a tax upon our time, and has occupied us to the exclusion of more important duties.

Advantages which have attended the procuring of the return.

But, heavy as have been the inroads which this return has made upon the time at our disposal, the time so expended has been very far from being thrown away. In the first place, we have obtained a more detailed and complete insight into the working of the Act by the local authority, and of the difficulties of such working, than it was possible to obtain in any other way.

In the second place, heavy as has been the correspondence entailed upon us, that correspondence is in no small degree a measure of the instruction which we have been able to afford to the local authorites as to their duties. No doubt, much of the instruction so given will be wasted; we are even disposed to think that our communications in some instances are scarcely read, still less considered; but in some cases, we are happy to say, our explanations have been gratefully received, and the clerks have acknowledged the advantage which they have derived from having their attention directed to points on which they were in error, or which had escaped their notice. Again, the return has been indirectly the means of causing local inspectors to be appointed in many places, while the annual renewal of licenses and registrations have also, as a consequence, become established is districts where it had previously been wholly overlooked. Indeed, it is not too much to say that through this return and the resulting correspondence, the Act has been brought into effective operation in places where previously it had not been applied at all, or only applied in a most imperfect and perfunctory manner. And in cases where the Act was being worked, the calling for this return has tended to stimulate the local authorities, and to strengthen their hands, by showing that its application is not intended to be a dead letter.

Instances of non-appointment of local inspectors.

The return, often incomplete and defective, has also been the means of affording us a good deal of useful information as to the number and position of stores and registered premises in various districts, and especially as to the appointment and non-appointment of local inspectors. Several very bad cases of the non-appointment of inspectors were brought under our notice by these returns. Thus, in the Bolton P.S. division there were returned 16 stores and 120 registered premises, but no officers had been appointed; in the Rotherham P.S. division there were 22 stores and 47 registered premises, and no officers; in the P.S. division of Langbaurgh East, which comprehends the greater part of the large and important mining district of Cleveland, there were 22 stores and 21 registered premises, but no officer; in the Glamorganshire Bridgend district there were 11 stores and 10 registered premises, and no officer; in the Atherstone P.S. division there were 16 stores and 10 registered

premises, and no officer; in the Langbaurgh North P.S. division there were 3 stores and 24 registered premises, and no officer; in the Blackburn P.S. division, in which 1 store and 25 registered premises were returned, there was no officer. Communications were addressed to the greater number of those local authorities in whose districts places had been licensed or registered, and who had appointed no officers, and we have since ascertained that in many of these cases officers have now been appointed. But it appears that up to the present time there are between 70 and 80 places where stores or registered premises exist, and where there is no local inspector.

Necessity for local inspectors.

We need hardly insist upon a fact to which we have more than once called attention, that where there is no inspector the Act must be practically a dead letter, and the responsibilities which the statute imposes upon the local authorities must remain undischarged. Some local authorities would almost appear to consider that there is an occult virtue in the granting of a store license or the registering of premises, and to hold that so soon as the act of licensing or registration is complete their responsibilities in regard to the safe and lawful conduct of the business are discharged. But a little reflection would serve to show that the granting of a license and the effecting of a registration are merely means to an end,—the end being to bring the place or premises under observation. Clearly, however, the device fails of its object, if, when the place has been so brought under observation, it is not observed, and if no inspector be appointed there can be no inspection. Thus the absence of such an appointment as that on which we are insisting, or any neglect on the part of the local authorities to see that the officers so appointed do faithfully and diligently carry out their inspectorial duties, must

Evil effects of non-inspection.

render the operation of the Act in the district practically inoperative. Nor is this all; for where the Act is not worked, not only are the public interests compromised, but those of the more law-abiding traders are liable to be injuriously affected. Having incurred some expense perhaps in carrying out the Act on their premises, having provided a suitable place of storage, and incurred the extra charges entailed in observing the regulations and in procuring his explosive in small quantities, a dealer has the mortification of finding that his trade rival has avoided all this extra cost by the simple expedient of neglecting to observe the law,—a course which he is able to adopt with impunity in places where the local authority neglect the duties imposed upon them, and exercise no vigilance to see that the law is strictly carried out. So that in such cases not only is the beneficial protective operation of the Act paralyzed, but a sense of injustice is created among those traders who desire to act properly in the matter. We have repeatedly seen instances and received complaints of this over and over again. Traders with whom we have come into contact have represented to us the grievance under which they suffer in respect of the inaction of the local authority; and indeed we may say that complaints have been much louder and more emphatic on the part of the trade than of the public; for the latter only cry out when they are hurt,—in other words, when an explosion happens, and the magnitude of unsuspected dangers in their midst is revealed. The trader, however, who desires to observe the law is at once commercially affected by the absence of its enforced observance as against his less scrupulous rivals.

Two of several cases which have come under our notice will illustrate this, though, for obvious reasons, we do not give the names.

A gunmaker in a large northern borough, where the Town Council are the local authority, has established an excellent store (No. 427) at a short distance out of the city. The store is in every respect conformable to the Act, and is constructed and conducted in a highly creditable manner. The cost of erecting such a store was not inconsiderable, and the occupier has to pay 15*l.* a year rent for the field in which it stands. He has also to incur the expense of a horse and cart to convey explosives to and from the store. He informed us that he personally highly approves of the Act,—that, as he expressed it, he "sleeps better," now that he has no longer, as he alleges he frequently had before the Act came into operation, 500 lbs. of gunpowder in his house. But he spoke with some indignation of the absence of all supervision on the part of the local authority, which resulted in others of his neighbours still continuing, to his personal knowledge, to store excessive quantities of gunpowder in their shops and premises; and he asked why none of the other dealers in the city had had to go to the same expense. He added that no officer of the local authority had ever inspected his premises, and that he found by experience that he had received no encouragement, but practically very much the reverse, in his efforts to observe the law.

In another town in the North of England, where the justices in petty sessions are the local authority, an almost identical state of things existed. One dealer had erected a well-built store (No. 412) outside the town, and had thus tied up a portion of his trade capital; while other dealers, on, as he assured me, as large, if not a larger scale than himself, had taken no such precautions, and continued to stow away their powder in their warehouses and premises. Of course in these cases we took immediate steps to call attention of the local authorities to the matter, and we trust that the evils indicated may in these particular instances be rectified.

But, unfortunately, there is too much reason to believe that these are merely examples of a very large class of similar cases in different parts of the kingdom, for which nothing but a general awakening of the local authorities to a sense of their responsibilities, and of the evils which a neglect of them must entail, will afford a satisfactory remedy.

Example of local failure of Act owing to non-appointment of local inspector.

A very striking example of the extent to which the Act is necessarily a dead letter where there is no local inspector is afforded by the returns from the Petty Sessional Division of East Grinstead. According to these returns, 34 premises were registered in this district in 1876; no inspector was appointed; and it is therefore scarcely surprising to find that of this number only 9 premises were re-registered in 1877, while in 1878 (there being still no inspector) the number of registered premises had fallen to 2. This case also brings into marked contrast the general readiness of the traders to conform to the law, and the unreadiness of those upon whom the duty of administering the law devolves to further their endeavours.

Steps taken to assist and encourage local authorities in discharge of their duties.

Being deeply impressed with the importance of sparing no pains to procure a more efficient administration of the law on the part of the local authorities generally, we have not relaxed our efforts during the year to afford them all assistance towards the proper discharge of their duties which is in our power. Thus, in addition to the many hundreds of letters of advice and explanation which we have written in connection with the return already referred, a number of Summaries of the Act as it affects stores, small firework factories, and retail premises respectively, with explanatory comments, have been prepared by us, and these can be procured through any of the Stationery Office publishers at the nominal cost of one penny each. A circular was issued on the 4th June (see Appendix X) to all chief constables of counties and town clerks, directing special attention not only to those Summaries, but to the Guide Book to the Act which was prepared in 1877, and of which, we are pleased to be able to state, as many as 3,449 copies (of which 568 have been for official use)* have been disposed of, being an increase of 1,253 on the number sold up to the end of 1877, when the figures stood at 2,196 copies (of which 33 were for official use). It has been found necessary to prepare a second edition of this book. We have also personally visited the clerks of 99 local authorities during the year, and have done our best to make clear to them any points on which they were in doubt or difficulty. We have, so far as the time at our disposal admitted, continued the explanatory lectures to assembled officers of county constabulary, who have been appointed officers of the local authority. We gave five such lectures in Cumberland and Westmorland, and one in Monmouthshire, and we have reason to believe that they are likely to prove useful to the officers concerned. We have, in our various inspections endeavoured, as far as practicable, to take the local inspector with us, and thus point out to him practically the chief matters to which his attention should be directed in carrying out his inspections, while availing ourselves of the time at our disposal in travelling to and from the different places to explain to him the Act as it affects his duties. We have found this plan to be attended with great advantage, both as affording instruction to the officers, and as assisting and encouraging those among them who are trying to do their duty. Although the number and efficiency of the local inspectors still fall very far short of what they should be, we are happy to be able to state that in several places we have come across inspectors who appear to us to be discharging their duties with zeal and ability, and whose districts, consequently, in regard to the condition of the stores and premises, leaves little to be desired. It is the more satisfactory to be able to note this, because it shows that the duties of a local inspector are not beyond the powers of an intelligent inspector or superintendent of police; and thus one reproach which is commonly levelled against the Act by justices clerks and others, who appear to have scarcely looked into it, viz. that its difficulties of construction present an insuperable obstacle to its efficient administration, really disappears.

An Act which, with the aid of a Guide Book, and in some cases without any explanation or assistance from ourselves, an average sergeant of county police can, as we have found, master and administer successfully in the intervals of his other duties, ought not to be unintelligible to the trained minds of the solicitors and others who officiate as town clerks and as clerks to the justices. The fact is, as we stated in our last Report, that the alleged excessive difficulty of the Act is in a large majority of cases a mere excuse for indifference and inaction. The Act is a long one; it is, from its very nature, intricate and technical; but its difficulties and technicalities are not likely to be solved by the expedient of leaving it on the shelf unopened. If, as we have shown, the mere sending a copy of a register takes some clerks more than nine months to accomplish, it can hardly be expected that these gentlemen will devote the time which is necessary to the comprehension of an Act of Parliament of somewhat exceptional length and intricacy. But we venture to assert, from our experience of a very considerable number of local authorities' clerks, that in the case of many of these officers

* The larger proportion of those for official use have been obtained for the use of the Royal Irish constabulary.

almost any Act dealing with this subject, and imposing upon them extra duties without extra remuneration, would have been dubbed unintelligible and unworkable; and each year we see increased grounds for satisfaction that, as we expressed it in our last year's Report, "the "interests of the trade and of the public were not sacrificed to the convenience of the clerks "of the local authorities and their officers, as they must have been if the Act had been "drawn sufficiently short and simple to satisfy their conceptions of easy intelligibility,"—if, indeed, such a point of simplicity and brevity were attainable; for it must be remembered that "the various distinctions and provisions to which the Act mainly owes its length and "apparent difficulty are but distinctions which follow the ramifications of a very varied and "exceptional trade, possessing many interests and including many risks, and are accordingly "so many provisions either for trade members or for the public safety, the absence of which "would be incompatible with the one or the other." *

Steps taken to secure stricter observance of the Act in Ireland.

In consequence of the representations which we have felt it our duty to make as to the neglectful administration of the Act in many of the districts of Ireland, the Irish Government in September last caused a circular to be issued by the Inspector General of the Royal Irish Constabulary to the forces under his command, calling attention to the powers of search conferred by section 3, and requiring each sub-inspector to make careful inquiry with the view of ascertaining definitely whether there are in his district any explosives in contravention of the Act, and, when necessary, to obtain a search warrant, and to report the result in each case with a view to such action being taken as the Government might decide. (H. O. paper $\frac{1}{6}\frac{5}{9}\frac{8}{2}\frac{4}{}\frac{8}{}$.) Copies of the Guide Book were issued for the use of county inspectors and sub-inspectors and of the constabulary in important towns. (For circular, see Appendix Y.)

It may not be inappropriate here to remark that especial difficulties beset the administration of the Act in Ireland, from the fact that, owing to there being no county constabulary, the appointment of police officers to act as local inspectors is impossible.

Consequently, the justices commonly appoint their clerks; and, so far as our experience goes, the majority of these clerks are not well qualified for the duties which they are called upon to perform; while their strong local connection too often forms an impediment to the impartial and strict discharge of their duties. Thus, in too many instances the appointment is looked upon as little more than nominal; and it is hardly considered that the fee of from 5*l.* to 20*l.* per annum, which is generally attached to the office, imposes any very strenuous obligation upon the holder in regard to inspectorial duties. Further, the fact that,—as actually happened last spring in one case in an Irish city where we had occasion to seize a quantity of explosive on the premises of a leading tradesman, himself a member of the city magistracy,—the clerk may be called upon to institute proceedings against one of the Bench for which he acts as clerk, is not conducive to a satisfactory administration of the law. What we have seen of the working of the Act in Ireland leads us to doubt whether, with the existing local authorities and the existing system, the working of the Act can ever be otherwise than unsatisfactory in that country, except in a few special localities.

It has been our duty in this Report to speak strongly and plainly as to the shortcomings of a large proportion of the local authorities throughout the kingdom, but we feel that it is impossible for us to do otherwise. It is more than probable that some day their inactivity and non-discharge of statutory obligations is likely to result in some serious disaster, and we think it only due to ourselves to point out that the numerous failures of the local authorities to take up with vigour the duties imposed upon them by the Act are not unknown to us; that such failures are not viewed by us with complacency, but rather with apprehension and keen regret; and that we have used and shall continue to use our best endeavours to stimulate the local authorities generally to the activity and vigilance which are already displayed by many, and without which the Act must largely fail of its protective effect, while introducing new disorders and irregularities as between trader and trader.

VII.

Accidents.

Accidents.

The number of accidents by explosion and fire, of which this Department has had cognizance during the year, was 104, causing, so far as is known, 40 deaths, and injuring 92 persons. Comparing this result with the returns for previous years, it appears unsatisfactory; the return for 1877 having shown only 66 accidents, with 24 resulting deaths and 46 cases of injury. But we have invariably insisted in our Reports that our returns of accidents were very incomplete, owing to the fact that accidents are frequently not reported, especially the smaller accidents (such as those which occur in mining operations),

* Annual Report for 1877, p. 36.

by which, perhaps, only a single life is lost, or one or two persons only sustain injury. In our last Report we stated that "we think it not improbable that the tale of accidents will, for "some time to come, show a tendency rather to increase than to decrease," because we anticipate that by degrees we shall obtain more complete information as to the occurrence of accidents. During the past year great efforts have been made by us to obtain reports of all accidents: Thus, the Mines Inspectors in the instructions issued from the Home Office are directed as follows: "On receiving any notice of an accident by explosion or fire in "connexion with the use, storage, or transport of gunpowder or any other explosive (as "defined by the Explosives Act, 1875), the Inspector of Mines will forward a copy of the "same to the Secretary of State by the same post. If the notice contain detailed particulars, "then, instead of a copy, the original may be sent to the Home Office, with a request that "it should be immediately returned; also, if it should come to the knowledge of an Inspector "of Mines that there has taken place in a mine within his district any explosion (either of "gunpowder or other explosive) or any fire, which, by reason of its not having caused any "loss of life or personal injury to any person employed in or about the mine, is not required "to be formally notified to him, but which he has reason to suppose ought to be investigated "by an Inspector of Explosives, or information as to which is likely, in his opinion, to assist "an Inspector of Explosives in the discharge of his duty, it will be desirable that he should "at once communicate the fact to the Secretary of State."

The attention of the officers of the local authorities has been repeatedly called by us, in personal communications which we have had with them, to the necessity of seeing that whenever an accident occurs in or in connection with any store or registered premises, or in conveyance, it is duly reported; and passages in the Guide Book (of which, in consequence of the Home Office circular of the 4th June 1878, most of these officers have a copy,) expressly direct attention to this point.*

In every instance in which a Coroner has been found to neglect the duty imposed upon him by the 65th section of the Explosives Act, of giving notice of an inquest in cases where the death has been caused by any accident, he has been personally communicated with; and as such cases were found to be not infrequent, a circular was, on the 16th November last, issued to all Coroners in England and Wales, and (through the Irish Government on 9th December) to all Coroners in Ireland, calling their attention to a former circular on the subject, and directing their strict observance of the provisions of the Act as to giving such notices. (See Appendix Z.)

All paragraphs in the newspapers relating to explosions have been carefully noted, and, when needful, special inquiry has been made. The result of these exertions to obtain information of all accidents has been to swell the list of recorded accidents very considerably.

Classification of accidents.

In dealing with this branch of our Report we have felt that some improved method of treatment over that hitherto adopted by us was necessary.

To present the sum total of the casualties with the different explosives, without any attempt at classification under various heads, is, we feel, unsatisfactory, because such a system affords no sufficient indication of the extent to which the operation of the Act has been beneficial in the prevention or limitation of the effects of accidents. Thus, in the direction in which accidents are most numerous, viz: in the *use* of explosives, the Act can be credited neither with failure nor success,—for as to the use of explosives it is absolutely silent. On the other hand, the operation of the Act in diminishing the number or limiting the effects of accidents in manufacture, keeping, and conveyance is a matter which can hardly fail to possess a high interest to any one who is concerned with its practical working. Accordingly, we have, in the present Report, adopted a totally new system of recording the accidents, so as to distinguish between those which have occurred in the manufacture, keeping, and conveyance of explosive (matters as to which the Act claims control), and those which have occurred in connection with the use of explosives (as to which the Act exercises no control). We have also shown how many accidents are due under each head, as well as conjointly, to each description of explosive.

This arrangement necessitates the six following tables†, which are all derived from the parent list of accidents (with brief details of each) given in Appendix W.

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* Guide Book, pp. 53, 89, 117, 124, 136, 140, 145.

† The mode of classification here adopted for the first time renders any tabular comparison between the accidents of the present, and those of the past years, impossible.

SUMMARY OF ACCIDENTS.

TABLE I.—Showing ACCIDENTS grouped under the several heads of MANUFACTURE, KEEPING, CONVEYANCE, USE, and MISCELLANEOUS.

SUMMARY.	Accidents causing Loss of Life and Bodily Injury.			Accidents not causing Loss of Life or Bodily Injury.	Total Number of Accidents.	REMARKS.
	No. of Accidents.	No. of Persons				
		Killed.	Injured.			
Manufacture	15	8	15	26	41	For details, see Table III.
Keeping	5	3	8	1	6	Do. see Table IV.
Conveyance	—	—	—	—	—	Do. see Table V.
Use and Miscellaneous*	56	29	69	1	57	Do. see Table VI.
	76	40	92	28	104	

* Under this head are included all accidents which occurred in the use of explosives, and immediately connected therewith; also accidents in thawing dynamite, and others arising from miscellaneous causes not within the prohibitions of the Act. In short, this group comprises all accidents occurring under circumstances not immediately controlled by the Act.

TABLE II.—Showing the TOTAL NUMBER and NATURE of ACCIDENTS caused by each description of EXPLOSIVE.

Class.	Nature of Explosive.	Accidents causing Loss of Life and Bodily Injury.			Accidents not causing Loss of Life or Bodily Injury.	Total Number of Accidents.	REMARKS.
		No. of Accidents.	No. of Persons				
			Killed.	Injured.			
Class 1.							
Gunpowder	Gunpowder	36	22	38	14	50	For the reference to the Index Nos. of the several accidents with each description of explosive, see the Tables grouping the accidents under the heads of Manufacture, Keeping, Conveyance, Use, and Miscellaneous. (Tables III. IV. V. VI.)
Class 2.							
Nitrate mixture	—	—	—	—	—	—	
Class 3.							
Nitro compound	Dynamite	18	12	22	1	19	
Div. 1	Guncotton	2 } 25	1 } 14	12 } 38	— } 8	2 } 33	
Div. 2	Tonite or cotton powder.	5	1	4	7	12	
Class 4.							
Chlorate mixture	—	—	—	—	—	—	This class of explosive is not in use.
Class 5.							
Fulminate	Detonating composition.	1	1	—	—	1	
Class 6.							
Ammunition:—							
Div. 1	Safety cartridges	1	—	1	—	1	
	Percussion caps	1	—	1	2	3	
Div. 2	War rockets	1	—	2	—	1	
	Blasting fuzes	1 } 12	1 } 3	— } 14	— } 4	1 } 16	
Div. 3	Detonators	7	2	8	2	9	
	Experimental sound rockets.	1	—	2	—	1	
Class 7.							
Fireworks	Fireworks	2	—	2	2	4	
	Total	76	40	92	28	104	

TABLE III.—Showing the TOTAL NUMBER and NATURE of ACCIDENTS in MANUFACTURE with each description of EXPLOSIVE.

Manufacture.

Class of Explosive.	Nature of Explosive.	Accidents causing Loss of Life and Bodily Injury.			Accidents not causing Loss of Life or Bodily Injury.	Total Number of Accidents in Manufacture.	Index No. in List of Explosives for 1878. (See Appendix W.)	REMARKS.
		No. of Accidents.	No. of Persons					
			Killed.	Injured.				
1. Gunpowder -	Gunpowder -	4	4	5	14	18	48,* 57,* 64,* 79, 6,* 8,* 9,* 17,* 19,* 22,* 24*, 31,* 41,* 50,* 52,* 54,* 55,* 94.*	The seventeen explosions marked (*) were all in incorporating mills. There was only one accident (79) not in an incorporating mill.
2. Nitrate mixture	—	—	—	—	—	—	—	
3. Nitro compound Div. 2.	Tonite or cotton powder.	1	—	1	7	8	83, 97, 98, 99, 100, 101, 102, 103.	The whole of these eight accidents occurred in the pressing of wet tonite.
4. Chlorate mixture.	—	—	—	—	—	—	—	This class of explosive is not manufactured.
5. Fulminate -	Detonating composition.	1	1	—	—	1	63.	
6. Ammunition:—								
Div. 1. -	Safety cartridges -	1	—	1	—	1	75.	
	Percussion caps -	1	—	1	2	3	28, 78, 85 -	These three accidents all occurred in the preparation or application of the cap composition.
Div. 2. -	War rockets -	1	—	2	—	1	53.	
	Blasting fuzes -	1	1	—	—	1	96 - -	A miner making a fuze for blasting in his house.
Div. 3. -	Detonators -	4	2	4	2	6	11, 25, 47, 74, 20, 81.	
7. Fireworks -	Fireworks -	1	—	1	1	2	1, 49.	
	Total -	15	8	15	26	41		

TABLE IV.—Showing the TOTAL NUMBER and NATURE of ACCIDENTS in the KEEPING of the different descriptions of EXPLOSIVES.

Keeping.

Class of Explosive.	Nature of Explosive.	Accidents causing Loss of Life and Bodily Injury.			Accidents not causing Loss of Life or Bodily Injury.	Total Number of Accidents in Keeping.	Index Nos. in List of Explosions in 1878. (See Appendix W.)	REMARKS.
		No. of Accidents.	No. of Persons					
			Killed.	Injured.				
1. Gunpowder -	Gunpowder -	4	3	7	—	4	3, 45, 65, 92.	
2. Nitrate mixture -	—	—	—	—	—	—	—	
3. Nitro compound	—	—	—	—	—	—	—	
4. Chlorate mixture	—	—	—	—	—	—	—	
5. Fulminate -	—	—	—	—	—	—	—	
6. Ammunition -	—	—	—	—	—	—	—	
7. Fireworks, Div. 2.	Manufactured fireworks.	1	—	1	1	2	70, 71.	
	Total -	5	3	8	1	6		

TABLE V.—Showing the TOTAL NUMBER and NATURE of ACCIDENTS in CONVEYANCE of the different descriptions of EXPLOSIVES.

Conveyance.

Nil.

TABLE VI.—Showing the TOTAL NUMBER and NATURE of ACCIDENTS occurring in the USE of the different EXPLOSIVES, and under miscellaneous circumstances.

*Use and Miscellaneous.**

Class of Explosive.	Nature of Explosive.	Accidents causing Loss of Life and Bodily Injury.			Accidents not causing Loss of Life or Bodily Injury.	Total No. of Accidents in Use and from Miscellaneous Causes.	Index No. in List of Explosions for 1878. (See Appendix W.)	REMARKS.
		No. of Accidents.	No. of Persons					
			Killed.	Injured.				
1. Gunpowder -	Gunpowder -	28	15	26	—	28	4, 14, 16, 33, 36, 37, 43, 46, 51, 56, 60, 61, 62, 66, 67, 68, 69, 72, 73, 77, 79, 86, 87, 90, 91, 93. 95, 104.	
2. Nitrate mixture	—	—	—	—	—	—		
3. Nitro compound, Div. 1.	Dynamite -	18	12	22	1	19	5,* 10, 12, 13,* 15, 18, 30, 32, 35, 39, 42, 44, 58, 59, 80, 82,* 88, 89.*	The four marked (*) occurred in the thawing of dynamite.
Div. 2.	Guncotton -	2	1	12	—	2	21, 40 - -	Out of the 12 returned as "injured," 11 were injured by inhalation of products of combustion in accident No. 21.
	Tonite or cotton powder.	4	1	3	—	4	2, 7, 27, 29.	
4. Chlorate mixture.	—	—	—	—	—	—		
5. Fulminate -	—	—	—	—		—		
6. Ammunition:—								
Div. 3. -	Detonators -	3		4	—	3	26, 34, 38.	
Div. 3. -	Experimental sound signals.	1	—	2	—	1	23.	
7. Fireworks -	—	—	—	—		—		
		56	29	69	1	57		

* Under this head are included all accidents which occurred in the use of explosives and immediately connected therewith; also accidents in thawing dynamite, and others arising from miscellaneous causes not directly within the prohibitions of the Act.

Comparison between accidents occurring under conditions as to which the Act exercises control and those which occur under conditions not controlled by the Act.

It is to us a matter of satisfaction to remark that of the total number of accidents more than half (56) occurred under the head of "Use and Miscellaneous," because, as we have explained, no reproach can attach to the Act in respect of accidents which arise under conditions to which it does not apply. Moreover, it is especially noticeable that out of the 47 accidents in manufacture, keeping, and conveyance, only 20 were accidents which occasioned loss of life and bodily injury, 27 of the cases having been unattended by personal hurt of any description. This result goes to show that the precautions which are taken under the Act to localise the effects of accidents when they do unfortunately occur are not ineffectual. The total number of persons killed and injured under these heads was 11 and 23 respectively. On the other hand, under the head of "Use and Miscellaneous," we find that out of the 57 accidents recorded, there was only one which was not attended either with loss of life or injury; and the resulting number of deaths was 29, and of persons injured 69.

Inquests.

During the year we have attended eight inquests. It is necessary for us, having regard to our other duties, to exercise discretion in every instance in which notice of an inquest is received, to decide whether the case is one in which the attendance of a Government Inspector would be likely to be advantageous to the public or to the Department. In many cases our attendance, as we have pointed out in former Reports, is clearly advantageous both to the jury and to ourselves; but it is impossible to conceal from ourselves that in some instances where it might *primâ facie* be anticipated that advantage would result from the presence of a Government Inspector at the inquest, our attendance, owing to the view which some coroners and their juries take of their duties, is little better than a waste of time.

Inquiries.

In seven cases we have, by your directions, held independent inquiries, under section 66, into the causes of accidents; and our Reports in all such cases have been printed, presented to Parliament, and communicated to the leading newspapers, and to other persons interested or concerned.

The cases in which we have held such inquiries are the following:—

	Report dated
Explosion of detonators in factory of Cotton Powder Company near Faversham, 12th February 1878 (Accident No. 11) -	6th March 1878.
Explosion of guncotton at Halkyn, Holywell, 10th April 1878 (Accident No. 21) - - - - -	28th June 1878.

	Report dated
Two explosions of dynamite at the Yarlside Mines, Parkhouse, on 14th May and 3rd July 1878 (Accidents Nos. 30, 35) -	27th July 1878.
Explosion of gunpowder store at Victoria Colliery, Bruntcliffe, by lightning, 6th August 1878 (Accident No. 45) - -	17th Sept. 1878.
Explosion of war rockets in factory at Whitehills, near Gravesend, 13th September 1878 (Accident No. 53) - -	30th Sept. 1878.
Explosion of dynamite at Carn Brea Mine, Redruth, 27th September 1878 (Accident No. 59) - - -	30th Oct. 1878.
Explosion in corning-house of Elterwater Gunpowder Factory on 29th November 1878 (Accident No. 79) - -	28th Dec. 1878.

Investigations.

It has not yet been found necessary to take advantage of the power conferred by section 66 of holding a more formal investigation, with a legal assessor.

Accidents in manufacture.

Explosions in incorporating mills.

We will now proceed to examine the accidents somewhat more in detail. On turning to Table 3, relating to accidents in manufacture, it will be observed that of the 18 explosions in gunpowder factories no less than 17 took place in incorporating mills,—a number which, curiously, exactly corresponds with that recorded in 1877.* As we remarked in our Report for last year, accidents in incorporating mills differ materially, not only in magnitude but in kind, from accidents in press-houses or similar buildings; and, owing mainly to the recognition of the fact that the occasional explosion of incorporating mills is almost unavoidable, and to the resulting precautions adopted for excluding the workpeople as much as possible while they are at work, these explosions do not commonly result in loss of life or personal injuries. This is well illustrated in the present year by the fact that of the 17 explosions of mills, in three cases only (Nos. 48, 57, 64,) was personal injury sustained, one man being killed and four injured), and the remaining 14 cases were unattended with personal hurt of any description.

Explosion of a corning house. (Accident No. 79.)

These results contrast significantly with those obtained in the single corning-house accident (Accident No. 79), by which three men were killed, and one was injured.

This corning-house accident, which occurred in the Elterwater Gunpowder Factory on the 29th November 1878, was, in regard to the loss of life, the most serious accident that we have to record during the year. It formed the subject of a Special Inquiry, the result of which is given in a Report dated 28th December 1878. It was unfortunately impossible to assign the exact cause with any confidence, for the accident not only proved fatal to all the men who were in the house at the time, but swept away all reliable traces of its origin. The varying degrees of probability attaching to the different possible causes are considered in the Report above referred to, and the Inquiry disclosed the fact that in several particulars the practices and management of the factory were defective, and these defects are specified and censured in the Report.

Fatal accident in incorporating mill. (Accident No. 48.)

The only accident in an incorporating mill by which death was caused, (No. 48), occurred in Messrs. Williamson and Co.'s Gunpowder Factory at Fernilee, near Buxton. It is noticeable that it was not an ordinary mill accident; that is to say, it did not occur in the process of the incorporation of the ingredients, but in the carrying out of some repairs in a mill from which all accumulations of powder had not (as required by section 10, sub-section 5 of the Act,) been wholly removed.†

Importance of requiring danger buildings to be thoroughly cleansed before repairs.

The result of this omission strictly to observe this salutary regulation was that the application of one of the tools caused an explosion, from the effects of which one man died, and two others sustained injury. The rule above referred to is one of which the importance has been emphasized by more than one accident resulting from its non-observance, and the value of which is generally recognized by the trade. In the present case it does not appear that there was any intention to evade the rule, but it is quite clear that the arrangements for securing its effective operation in this factory were exceedingly imperfect; and we are of opinion that although the arrangements or want of arrangements were perhaps scarcely of a character to have sustained a criminal charge, they justify our pronouncing a censure on the management in regard to this matter.

Accidents in incorporating mills causing injury. (Accidents Nos. 59 & 66.)

The only other two cases in which the explosion of an incorporating mill caused bodily injury (Nos. 57 and 64) occurred in Messrs. Dickson and Co.'s Gunpowder Factory at Blackbeck; in both instances the mills had just been started, and the millmen had not had time to remove to a safe distance.

Importance of providing protection to millmen when starting a mill.

These two accidents illustrate a point on which we have frequently insisted; viz., that the incorporating mills should invariably be so arranged as to allow of their being started by a

* See Annual Report for 1877, p. 30.

† Section 10, sub-section 5, enacts as follows:—Before repairs are done to or in any room in or other part of a danger building, that room or part shall, so far as is practicable, be cleaned by the removal of all gunpowder, and wholly or partly mixed ingredients thereof, and the thorough washing out of such room or part.

man under cover. In the very large proportion of cases mill explosions take place on, or very shortly after, the starting of the runners; and as the explosion in such cases is not generally of a formidable character, there is no practical difficulty in the way of placing the millmen at this dangerous moment under effective cover.*

Accidents in the manufacture of wet tonite. (Accidents Nos. 83, 97 to 104.)

The eight accidents which occurred in the manufacture of tonite or cotton powder all happened in the pressing of the wet material into blasting cartridges. Fortunately, in only one instance (No. 83) was any bodily injury inflicted, and in that case the injury was of a trifling character. But these accidents having all occurred with the material in a damp, and therefore in what would be commonly regarded as a safe condition, call for a few words of special observation. The fact is that accidents with material of this description, when in a wet condition, are by no means uncommon. Thus, at the Stowmarket Factory, where the material is pressed wet, there were at one time not unfrequent occurrences of this sort. Two such accidents have occurred in the pressing of wet guncotton at the Government Guncotton Factory at Waltham, viz., one in 1873 and the other in 1877. A serious accident occurred in the Royal Laboratory, Woolwich, in 1875, during the loading of a shell with wet guncotton, by which two lives were lost;† and in 1877 there was a case of the ignition of some guncotton during the operation of sawing the wet slabs of the same into charges of the required size in the Royal Laboratory.

Explanation of occurrence of accidents with substances of the guncotton class when in a damp condition.

All these accidents may undoubtedly be referred to the same primary cause, although brought about in different ways in each instance.

This cause may be stated to be that some small portion of the guncotton is, during the process of pressing or sawing, exposed to the heating, and therefore drying influence of friction or pressure. If the friction or pressure be of such a character, or be so maintained upon any portion of the guncotton, as to dry the particles upon which it is exerted sufficiently to render them inflammable, the continuing friction or pressure will, as the next step, establish the actual inflammation of the particles. In the case of the guncotton which took fire in the process of sawing, it is reasonable to suppose that some dry or nearly dry guncotton sawdust had accumulated under the bed of the saw, or in the immediate neighbourhood of the point where the inflammation became first established; and this, in its turn, caught fire and produced the accident. In the cases of accidents in the pressing of wet guncotton, whether in hydraulic or steam presses, or in the charging of a shell, if we once assume an ignition of a particle, the resulting explosion can be easily accounted for. The heat generated by the burning of the ignited particles would gradually dry the contiguous portions, and the inflammation would extend with progressive energy, until the pressure of the accumulating gases overpowered the resistance of the press or shell or piston, and (in the absence of some safety valve or easier method of escape) determined the violent disruption of the containing case. As to how the undue friction becomes first established, that is a point which would have to be determined for each case separately. It may arise from two metal surfaces with only particles of guncotton between them bearing upon one another, in consequence of some defect in the original construction of the machine or tool, or from failure in their application; or it may be due to the presence of some grit or other rigid substance upon one of the metal surfaces, with only a small portion of guncotton interposed. But, however the accident may originate in each particular instance, it is, we believe, beyond a question that the rationale of such accidents is to be found in the explanation which we have given above. And it is important to call particular attention to this class of accident and nature of risk, because there is too common a tendency to assume that so long as substances of this sort are wet, nay, that even if they have been at any time wetted, they remain harmless until they have been formally dried; and thus precautions which would certainly not be neglected with the dry explosive are deemed unnecessary so long as the material is in what is assumed to be a damp condition, while arrangements which may be necessary for preventing any portion of the inflammable substance from resuming its inflammable condition during the operations of manufacture are overlooked or disregarded.

Explosion in mixing detonating composition. (Accident No. 63.)

The accident with detonating composition (No. 63) occurred in Messrs. Joyce's Cap Factory in Waltham, when one of the principals, Mr. F. Joyce, was engaged in mixing some (presumably percussion cap) composition in a shed set apart for the purpose. No one but the deceased was in the shed at the time, and we were unable to say to what cause the accident was due. In dealing with a highly sensitive detonating composition very minute causes may lead to serious results, and even the accidental slipping of a tool from the operator's hand, or a momentary incautious handling of the same, may determine an explosion. More than one accident has occurred in the Royal Arsenal, Woolwich, from the mere

* At the Government Factory, and at the majority of the private factories, effective cover is provided for the millmen.

† See Annual Report of H.M.'s Inspector of Explosives up to 31st December 1875, p. 12.

scraping up of cap composition on a highly polished metal plate with a wooden scraper. We are of opinion that the system which was adopted in the Royal Laboratory some years ago, of placing the workman at a little distance from the mixing table, and screening as much of his body as possible by a stout metal screen, is one which, although it will not of course render accidents of this sort impossible, is calculated greatly to reduce their probable consequences, and is therefore worthy of the attention of those who are engaged in this hazardous business. The three accidents with percussion caps (Nos. 20, 78, and 85) occurred in Messrs. Eley's Factory at Edmonton, and, owing to the composition being manipulated in a damp state, and in very small quantities, were of a trifling character. Indeed, in only one of these accidents was any injury sustained (viz., No. 28), and in this case the injury was quite inconsiderable.

Accidents in the manufacture of war rockets. (Accident No. 53.)

The accident in the manufacture of war rockets (No. 53) at Mr. Macdonald's Rocket Factory near Gravesend formed the subject of a Special Inquiry and Report (dated 30th September 1878); and the conclusions arrived at were, that, on a review of the various possible causes, the balance of probability on the whole inclined to the accident having resulted from "the establishment of undue friction from the clogging of the composition "between the drift and the case, favoured possibly by the presence of some slight foreign "or gritty matter." The explosion in this instance was exceedingly violent, although local in its effect; the thick iron mould was burst in two, much damage was done to the building and machinery, and two men sustained injury. It is noticeable that two accidents in the pressing of war rockets occurred in the Royal Arsenal during the year. The first, which happened on the 26th July, was probably occasioned by the presence of some gritty or metallic particles. It occurred during the withdrawal of a drift, when fortunately the pressure was on none of the other rockets. No one was hurt; the rockets merely squibbed off, one or two of them propelling their drifts through the roof.

The other accident in the Arsenal took place on the 23rd December, during the pressing of some 6-inch rockets. In this case, although the mould was uninjured, the upper part of the rocket case, where it was unsupported by the mould, was torn asunder, and the pellets and the composition in the building becoming ignited the four men present sustained injury by burning. In this case the accident was almost certainly due to the friction of the drift against the metal rib which formed the seam of the rocket case.

In regard to these accidents, we think it well to repeat a passage which occurs in our Report on the accident at Mr. Macdonald's factory:—"Seeing that, with all precautions, the "operation of forcing what is in fact gunpowder with great pressure into an iron case "must always remain a very hazardous one, it would certainly be prudent to adopt an "arrangement by which the men engaged in pumping up the press should be outside the "compartment when the pressure is being applied." This plan has (since the second accident) been adopted in the Royal Arsenal.

Accident in the manufacture of blasting fuze in a dwelling-house. (No. 96.)

The accident in the manufacture of blasting fuze (No. 96) occurred in a private dwelling-house at Wingate Grange Colliery (Easington Ward, Durham), while a pitman was (illegally) engaged in making fuzes of some sort (possibly merely straws filled with powder) for blasting purposes in his bedroom. The unfortunate man paid the penalty with his life.

Illegality of the practice.

The carrying on of any process of manufacture of this sort in a dwelling-house, or otherwise than in a licensed factory or "workshop" (sections 4 and 47), is distinctly illegal.

We discussed this point, in connection with the analogous illegality of making blasting cartridges, in our last year's Report*, and no pains should be spared by the local authorities (by whom alone the practice can be effectually put down) to prevent the improper and dangerous manufacture of explosives in unauthorized places. In the present instance there was the less excuse for such illegal making, because the Colliery Company under which this man worked had provided a suitable workshop under section 47, in which to carry on the making of blasting cartridges, &c.

Fatal accident in manufacture of detonators. (Accident No. 25.)

Of the six accidents which occurred in the manufacture of detonators, one (No. 25) which happened at the Detonator Factory of the Nobel's Explosive Company at West Quarter, and caused the death of two girls, was the result of foolish skylarking on the part of the deceased. It appears that the two girls were engaged in conveying a small truck containing some semi-manufactured detonators and some detonator composition from the magazine to the working shed, preparatory to commencing work for the morning. They had been to a dance the night before, and, excited probably by the recollections of their enjoyments, they left the platform, and began waltzing together; they tripped or stumbled, and in falling upset the truck, occasioning the explosion of the whole of the detonators and composition therein. The two girls were blown to pieces. The accident was inquired into by the Procurator Fiscal,

* Annual Report for 1877, pp. 5, 6.

Illustration of necessity of enforcing strict discipline in factories of explosives.

The foreman of the factory in this case seem to have been greatly to blame. There is no doubt that he saw the girls leave the platform and commence dancing; and, whether he remonstrated with them or not, it is certain that he failed to insist on their immediately discontinuing what was a distinct violation of the factory rules. This accident affords an illustration of the necessity of enforcing in factories of this description the strictest discipline, and of sharply checking the slightest departure from the regulations.

Accident in manufacture of detonators near Faversham. (Accident No. 11.)

Another serious accident with detonators (No. 11), though happily unattended with fatal results, occurred in the works of the Cotton Powder Company near Faversham, on the 17th February, and occasioned very severe injuries to a boy and a man. This accident formed the subject of a Special Inquiry (dated 6th March 1878). It appears almost certainly to have resulted from the descent of a portion of the pressing machines upon a detonator, which was accidentally lying across the hole, and the explosion thus established extended to about 600 detonators and a little composition present in the building. No small blame, in our opinion, attached in this case to the "leading hand" for having entrusted a boy with the charge of the pressing machine. This work is of too important and delicate character to be properly confided to a boy; and it is, we believe, a fact, that in so employing him on this occasion the "leading hand" was assigning to him a duty which it was not intended by the manager he should perform.

Successful result of precautionary alterations. (Accident No. 81.)

Some precautionary alterations which were introduced by the Company after this accident have been so far successful that in a subsequent accident (No. 81) which occurred in this factory in the pressing of detonators, the damage was confined to the breaking of the machine and of the windows,—the protection afforded for the workpeople having saved them from injury.

Minor accidents in the manufacture of detonators. (Accidents Nos. 47, 74, and 20.)

The two other accidents in the manufacture of detonators by which bodily injury was caused (Nos. 47 and 74) both happened in the detonator factory of Nobel's Explosives Company at West Quarter, and in neither case were the injuries serious. The former of these two accidents appears to have been due to the improper use by the injured girl of an unauthorised implement for pressing the composition into the detonators. The other happened in the pressing machine, and only slightly injured one of the workpeople. The remaining detonator accident (No. 20) occurred in the same factory in one of the pressing machines. In this case no one was hurt.

Firework accidents. (Accidents Nos. 1 and 49.)

The accidents in firework factories were happily few and insignificant. Of the two accidents of this class, only one (No. 1) was attended with injury to any person. In this case the man was engaged (very imprudently) in breaking up some caked composition in a marmalade pot with a copper tool. The other accident (No. 49) happened in the finishing of some wheels, and resulted from the upsetting of a lamp which was used for the work. No one was hurt in this case.

Accidents in keeping explosive.

Passing to accidents in the keeping of explosives, of which we have only six to record, we desire to call attention to the fact that these accidents occurred only with gunpowder and fireworks.

Explosion of gunpowder store by lightning. (Accident No. 45.)

Of these the most interesting (No. 45) was the destruction by lightning of the gunpowder store at Messrs. Haigh's Victoria Colliery, Burntcliffe, on the 6th August, when 2,000 lbs. of powder were exploded. A Special Report on this accident, dated 17th September 1878, was furnished, the information for the same having been in great part derived from the Chief Constable and from the occupiers of the store. There can be no doubt that the accident was due to the unscientific and defective system of lightning conductor adopted, the conductor having been carefully isolated from the building (on a pole), and the building itself having an iron door (in no way connected with the conductor) at the opposite end. The conductor itself would also have been more efficient had it possessed a higher degree of conductivity, but we are hardly prepared to assert that it was inefficient from this cause. In the Special Report on this accident, the principles which should govern the application of lightning conductors to the protection of buildings (as enunciated some years ago by the late Sir Wm. Snow Harris) are fully explained. Although the explosion was a very considerable one, having been intensified by the extremely solid character of the store (three bricks thick throughout, with a stout three-brick arched roof), the actual injury sustained was, owing to its comparatively isolated situation, slight. Two children were injured (one had his leg broken), a number of windows were broken, about an acre and a half of standing oats and barley were destroyed, and in a few instances some slight structural damage was effected by the impact of projected bricks and debris.

Fatal gunpowder accident at Nitshill. (Accident No. 65.)

By an accident (No. 65) which occurred at Nitshill, near Glasgow, on the 17th October, two lives were lost, and one person sustained injury. The accident formed the subject of a careful investigation by the Procurator Fiscal, and although the exact cause was not ascertained there is reason to believe that it was occasioned by the ignition, by one of the two deceased children, of some gunpowder which their father, who was marker at the volunteer range, had

(as it would appear, illegally) extracted from some small-arm cartridges and deposited in his house with a view to disposing of the same for blasting purposes. As this case is still occupying the attention of the Scotch law officers we refrain from remarking on it more particularly.

Fatal accident in the keeping of gunpowder at Skelmersdale. (Accident No. 3.)

The only other fatal accident recorded in the keeping of gunpowder (No. 3) happened at Skelmersdale, and was occasioned by a boy who had gone into a shop throwing the lighted wick of a candle accidentally into an open keg partially filled with gunpowder. In this case the having the powder in an *open* keg constituted a distinct violation of the 5th General Rule for registered premises for gunpowder (sect. 22, sub-sect. 5). It is probable also that it was in violation of sect. 23.

Accidents in the keeping of fireworks. (Accidents Nos. 70 and 71.)

The two accidents (Nos. 70 and 71) which are recorded to have occurred in the keeping of fireworks would not have occurred had the fireworks been deposited in a properly closed and secure receptacle as required by the Act. In one of these cases (No. 70) the accident resulted from the almost incredible stupidity of the occupier of a shop at Newport (Mon.), who fired off a cracker in the shop, wherein was a quantity of fireworks exposed for sale. The stock of fireworks became ignited, and the occupier sustained very serious injuries, while the premises were considerably damaged. In the other accident (No. 71) some exposed fireworks became ignited by a match which had been thrown lighted on one side after lighting the gas.

It is to be regretted that in these instances the officers of the local authority had not discharged their duty of preventing the exposure of fireworks in registered premises. In each case the attention of the local authority has been called to this neglect, with a view to their taking such proceedings as they may deem desirable.

No accidents in conveyance of explosives during the year.

It is a matter of great satisfaction to us to be able to report that, so far as we are aware, no accidents have occurred in the conveyance of explosive.

Accidents in the "use" &c. of explosives.

It is not possible to examine the 57 accidents which occurred under the head of "Use and Miscellaneous" as closely as we have examined the accidents in manufacture and keeping, without unduly extending our Report; we will therefore merely glance at the more remarkable accidents on this part of our list.

Accidents in ramming or unramming charges. (Nos. 33, 37, 40, 43, 46, 51, 68, 69.)

Of the 28 gunpowder accidents, six (Nos. 33, 43, 46, 51, 68, 69) appear to have occurred in the process of ramming or unramming the charge; and in another case (No. 37) the accident happened in the act of withdrawing the steel needle or pricker; a similar accident occurred with guncotton (No. 40). These, together with some accidents from pieces of projected stone, and from the accidental ignition of some powder, belong to a class of accident of which it is probable there will always be some to record in blasting operations. They are accidents the avoidance of which mainly depends upon the exercise by miners and quarrymen of greater care and vigilance than they are commonly disposed to bestow, and upon a more scrupulous attention to the regulations laid down for their guidance and protection. They are also obviously accidents which the provisions of an Act of Parliament can scarcely touch.

Accidents from defective action of safety fuze. (Accidents Nos. 18, 39, 66, 77, 87, 88.)

Accidents arising out of the premature action of the blasting fuze (No. 66), or from the deferred or imperfect action of the same (Nos. 18, 39, 77, 87, 88), ought to be preventible. The first-named of these probably resulted from a defect in the manufacture of the fuze, whereby an air space became established in the centre of the fuze, down which the flash would travel instantaneously, as in the case of a gun tube or quick-match "leader." This defect has been found to exist even in safety fuze of the highest reputation, but we are of opinion that it is one which the manufacturers of this article ought to be able to avoid. The cases* of accidents arising out of deferred explosions (Nos. 18, 39, 77, 87, and 88) ought to be even more preventible. We have been led lately to look more closely into this matter, and it is quite evident that very considerable retardations in the action of safety fuze, or "hang-fires," may arise from more than one cause or combination of causes. Thus, a defect in the manufacture, the presence of oil or damp in the powder column, the "kinking" or semi-fracture of the fuze in storage or handling, are among the causes to which these hang-fires may be due. Possibly in some cases they may arise from the miner unintentionally igniting only the yarn of the fuze, which smoulders on until the fire reaches the column of powder (the top of which may have become shaken out of the end of the fuze) and then action unexpectedly ensues. But in the majority of instances (and that there are numerous instances of this sort on record our inquiries place beyond doubt) it is more probable that the interruption occurs after the fuze has actually become ignited, and that the smouldering of the strands of the fuse at this part produces the hang-fire. A simple remedy against any evil consequences from such hang-fires, is to establish a rule prohibiting any miner to approach a fuze which has apparently "missed fire" for a considerable interval

* Since this report was commenced another accident from this cause has occurred in Cornwall.

of time. Judging from the information we have received as to the duration of the retardations, we are disposed to think that the interval so required to be laid down should be not less than half an hour, and if practicable should be longer.*

Accident from 1 lb. of gunpowder.

Accident No. 104, by which two lives were lost and four persons were injured, is an example of the danger arising from the explosion of even so small a quantity of gunpowder as 1 lb. In this case a drunken fellow dropped 1 lb. of gunpowder, which he had just purchased, into fire, with the result stated.

Accidents with dynamite.

Although the dynamite accidents have been less numerous than those with gunpowder (19 against 28) they have been nearly as fatal, 12 deaths having been occasioned by this explosive, and 22 persons having been injured.

Accidents in the thawing of dynamite. (Accidents Nos. 5, 13, 82, 89.)

Of the 19 accidents, four (Nos. 5, 13, 82, 89,) occurred in the thawing of dynamite, causing five deaths and injuring two persons. There are always some accidents due to this cause every winter; and it may be stated that in every instance these accidents are the result either of such a complete ignorance of the properties of dynamite as should be regarded as disqualifying the man from having it entrusted to him to use, or of an almost criminal recklessness, which is often only too characteristic of the miner. Such accidents are, moreover, brought about in defiance of the most emphatic instructions; for with each parcel of dynamite is issued a paper of instructions† peremptorily prohibiting the thawing of dynamite by means of fire, and directing that it shall be done by placing the dynamite in a pan surrounded by warm water; and yet year after year we find men sacrificing their own lives, and those of others, by (as in the case of accidents Nos. 5 and 13) placing the dynamite upon a stove, or (as in the case of accidents Nos. 82 and 89) placing it in a tin over a lighted fire or candle. In accident No. 82, the arrangements adopted would almost appear to have been elaborate, with a view not only to producing an explosion, but of ensuring that the explosion should be one of exceptional violence; for in this case the dynamite was placed in a tin beef-can partly filled with water, and suspended over a small wood fire. The inevitable result of this arrangement would be that the dynamite would rapidly dissolve, and the nitro-glycerine, being heavier than the water, would sink to the bottom of the case, where there would be interposed between it and the fire only the metal bottom of the can. Of course it would ultimately go off, and the explosive, being "tamped" by the water in the can, would develope its full force. We cannot disguise from ourselves the fact that these instances of recklessness may to some extent be traced to a statement which those interested in promoting the sale of this substance at one time diligently promulgated among the miners, viz., that dynamite might be set fire to and burnt without exploding.‡ The miners so instructed not unnaturally concluded that a material to which fire could actually be applied without producing an explosion was not one which was likely to be dangerously affected by the simple application of heat. If a dynamite cartridge could be put into the fire without exploding, surely it might be safely deposited on the hob. So the miners reasoned; and although we believe that these incorrect and misleading statements§ are now no longer in circulation, the impression which they created is, to our own knowledge, very deeply rooted, and it will take a long time, and perhaps the sad experience of many accidents, before that impression is wholly removed.

Accidents through exudation of nitro-glycerine at Yarlside mines. (Accidents Nos. 30 and 35.)

We regret that it has been our duty in the course of the year, in a Report on two accidents at the Yarlside Mines (Nos. 30 and 35), to comment on another dangerously misleading statement, which, until quite recently, was in circulation respecting dynamite,—the statement, namely, that its explosive properties are "unaffected by damp." In our Report for 1877 we recorded two explosions, one at the Penn Ricca Quarry, and the other at the Cwmbran Colliery, which were due to the boring of fresh blast holes in the neighbourhood of holes in which dynamite had been deposited a few days previously, and from which, owing to the action of water upon the dynamite, nitro-glycerine had exuded, in such manner that the tools used in boring the new holes had struck into the exuded nitro-glycerine and exploded it.

In referring to these explosions we expressed our regret that the manufacturers, notwithstanding the pointed way in which their attention had been called to what practically amounts to a dangerous defect in dynamite (a defect which had been terribly exemplified at the great

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* We have not ourselves succeeded in obtaining experimentally any retardations exceeding six or seven minutes, but we are continuing our experiments on this point, and it seems certain that retardations of about 20 minutes have actually occurred.

† Printed in English, Welsh, and Gaelic. During the year the manufacturers have again been requested by the Department to instruct their agents to warn consumers against thawing dynamite on a fire or stove, or issuing the same for use frozen (H.O. $\frac{25848}{602}$)

‡ See Annual Report for year ending 31st March 1875, p. 6.

§ "Incorrect" as well as "misleading," for although very small quantities of unfrozen dynamite may be burnt without exploding, large quantities cannot be so burnt, and in the case of frozen dynamite the quantities which may be so burnt are very small indeed.

Hamilton explosion of 1876), viz., its liability to become dissolved into its constituent parts by the action of water, had continued to advertise the misleading statement above mentioned. The observations which we then felt it our duty to make on this subject were not, unfortunately, attended with any effect, and there are good grounds for believing that the two Yarlside accidents of the 14th May and 3rd of July of the past year were the result of the exudation of nitro-glycerine from dynamite in wet blast-holes, the nitro-glycerine so exuded having been struck by the boring tools.

Accident from exuded nitro-glycerine in Festiniog Tunnel. (Accident No. 12.)

An accident (No. 12), which we believe may be ascribed to the same cause, occurred in a tunnel in process of formation between Bettws-y-Coed and Festiniog. Had the miners been properly instructed on this important point, and had the Company adopted the recommendation of the coroner's jury in the Penn Ricca case, and informed consumers generally "of "the danger of nitro-glycerine exuding from dynamite in wet holes, and holes tainted with "water,"* these accidents might, in our opinion, have been avoided; and without going so far as to assert that these accidents were the direct consequences of the misleading statement above mentioned, we may venture to express an opinion that that statement was calculated to confirm rather than to correct the ignorance in which accidents of this character frequently have their rise. The Company, it is fair to observe, contend that the statement is not, when properly considered, susceptible of the construction which we hold it naturally bears, and they urge that it is not strictly and literally incorrect. In our deliberate opinion this contention is unsound. It might be true to say that the explosive properties of *nitro-glycerine* are unaffected by damp, but it certainly is incorrect to make this statement as regards *dynamite*, when in fact the result of the contact of dynamite with water is to re-convert and separate the substance into the much more sensitively explosive liquid nitro-glycerine on the one hand, and on the other to deprive the solid constituent (kieselguhr) of all explosive properties whatever. Moreover, statements of this description are only too likely to be understood by the miner in the broadest possible sense, and to be taken as meaning that water has no effect upon dynamite. It is, therefore, a matter of satisfaction to us that the Company, while disputing the justice of the censure which we felt it right to pass upon them in this matter, have withdrawn the statement complained of from circulation.

Accidents from boring into portions of unexploded portions of dynamite and tonite left in the holes or among the débris. (Accidents Nos. 2, 7, 10, 15, 32, 58, 59, 80.)

There have been no less than eight accidents (Nos. 2, 7, 10, 15, 32, 58, 59, 80) due to the miner boring into or striking part of a charge of dynamite or tonite, of which a portion had remained unexploded in a hole or in some débris from a former blast. In the case of one of these accidents (No. 59) a Special Inquiry and Report (dated 30th October 1878) was made, and in this Report the circumstances under which portions of a charge of dynamite (and the same substantially holds good with guncotton or tonite) may remain unexploded in a hole were discussed at considerable length. That such an occurrence may take place is not only theoretically possible, even with a single hole, and with unfrozen dynamite, but there is ample testimony to the fact that in practice it actually does sometimes take place. (See Report above referred to.)

If several holes are blasted together, the occurrence becomes still more possible, from the fact that the upper part of one of the holes (containing the primer and detonator) may be blown off by the slightly earlier explosion of an adjacent charge, leaving the lower portion of the dynamite or guncotton in the slow hole unexploded. Such a condition of things may also as easily arise in the case of guncotton or tonite; and in a Special Report which we furnished on an accident which took place in the Festiniog tunnel in 1877,† we discussed this point, and showed that the occurrence was very far from being an uncommon one.

Necessity for causing old holes and their vicinity to be carefully searched before fresh holes are bored.

The teaching of these accidents (and of others of a similar character which have gone before) is, that in no case should boring be permitted in the vicinity of an old hole, until the place has been carefully searched by a competent and responsible person, so as to ensure the absence of all traces of explosive. If the holes have been wet holes, and dynamite has been used, all boring in the immediate vicinity, except on a higher level than the former holes, if possible, should be strictly prohibited, on account of the danger arising from the possible presence of exuded nitro-glycerine, and we cannot but think that manufacturers of nitro-glycerene preparations would be consulting their own ultimate interests, as well as those of the consumers of the material, were they to supply waterproof cartridges for use in wet holes.

Accident resulting from attempt to explode dynamite by means of a primary charge of gunpowder. (Accident No.15.)

The accident (No. 15) at Maen Offeren Slate Quary illustrates the danger of attempting to explode dynamite with gunpowder; for, in this instance, the charge of gunpowder exploded without exploding the dynamite, and when the men proceeded to drill out the hole (in which they believed all the material had exploded) it went off.

Accident through an attempt to force tonite cartridge

An accident (No. 27) occurred at the Cook and Ddol Quarry, through the reckless imprudence of a quarryman in trying to force a tonite cartridge into a hole which was too small for it.

* See recommendation of jury, quoted in our Annual Report for 1877, p. 33.

† Accident of 23rd August 1877. See Special Report of 29th September 1877.

into too tight a hole. (Accident No. 27.)

The only guncotton accident which calls for special remark was one (No. 21) which occurred at the Halkyn Tunnel works, by which one man was killed and eleven others sustained injury. The accident formed the subject of a Special Inquiry and Report (dated 28th June 1878), and was clearly due to the poisonous character of the fumes given off in the explosion of the guncotton, viz., carbonic oxide.

Misleading statement as to the character of the fumes from exploded guncotton.

This subject will be found fully discussed in the Special Report on the accident, and it will there be found also that we felt it our duty to censure in strong terms the Patent Safety Guncotton Company for allowing to appear in a pamphlet which they had issued setting forth the merits of their guncotton, a statement that "in close workings the absence of smoke "or *noxious gases* renders the use of guncotton doubly valuable;" whereas, in fact, as the manufacturers could hardly fail to be aware, a very deadly noxious gas, viz. carbonic oxide, is evolved in the explosion of guncotton,—a gas of so poisonous a character that one volume of it diffused through one hundred volumes of air totally unfits it to sustain life, and the insidious and dangerous character of which is aggravated by the fact that it does not, like carbonic acid, give any warning of its presence by extinguishing a light. It is deplorable that lives should annually be sacrificed and bodily injuries inflicted through mis-statements or suppressions of facts relating to the behaviour and peculiar risks of different explosives; and it is to be regretted that in such cases coroners' juries do not take a somewhat stricter view of their duties, and attach a more definite and serious responsibility to the promulgation of such misleading and dangerous statements. Even as it is, we believe that such statements, which, if they do not always directly lead to accidents, certainly do not tend to promote the *safe* use of these substances, must in the long run prove commercially unprofitable; for a single accident which brings to light unsuspected dangers in an explosive, tends to discredit it in proportion to the assurance with which the absolute safety of the explosive and its freedom from the dangers in question have been asserted. If a man blows himself up by boring a hole into a barrel of gunpowder with a red hot poker, the character of gunpowder remains unaffected; but if a miner is blown up while warming a cartridge which he has been told he may even set fire to with impunity, or is poisoned by the gases given off in the explosion of a substance which the world has been distinctly informed gives off "no noxious "gases," people naturally begin to inquire whether the substance really possesses all the other qualities claimed for it, and to entertain doubts as to the bonâ fides of the glowing statements preferred on its behalf.*

The accident thus does more harm to the reputation of the explosive than a dozen such accidents would do, if the miner had been forewarned against risks which every one in that case would have seen that the exercise of mere ordinary prudence on his part would have enabled him to avoid.†

Detonator accident through misconduct of a pitman. (Accident No. 38.)

One of the accidents with detonators (No. 38) recorded in our list resulted from the gross and deliberate misconduct of a pitman named Laverick, who invited a fellow pitman who was with him in a public-house to pick out the "white stuff" from a detonator with a pin. The white stuff was the charge of fulminate, and the result of pricking it was an explosion which shattered the fingers of the operator's hand.‡ Laverick, having, no doubt, a very good knowledge of what the result would be, had taken the precaution to leave the room before the pin was applied. He was subsequently committed for trial at the Durham assizes on a charge of feloniously maiming.§

Accident with experimental sound signal. (Accident No. 23.)

The last accident in our list to which reference need be made was one (No. 23) which occurred in the carrying out of some private experiments with sound signals by a Mr. Haworth, in company with Mr. J. M. Holt, M.P., at Balham. The signal appears to have consisted of a sort of ball, containing a mixture of chlorate of potash, fine steel filings, sulphur, and black oxide of manganese; and the explosion, so far as we were able to ascertain,

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* As an example of the extent to which injudicious and misleading advocacy of a substance may go (advocacy which is also either grossly ignorant or unscrupulous), we here quote a passage from "The National "Encyclopœdia" (Mackenzie, London and Glasgow), on the subject of guncotton:—"When it is added that "this substance is perfectly safe to store, transport, and handle, that its combustion when fired in this way" (by detonators) "is so complete that no noxious gases are given forth, and that the primers or detonating "substances are quite as harmless as ordinary percussion caps for fowlingpieces, it will be seen that mining "of all descriptions, military and civil, becomes immensely facilitated." As in this article reference is made to experiments carried out as recently as 1873, the authority cannot claim that it was written before more recent researches had thrown new lights upon the dangers of guncotton and detonators.

† Since this Report was commenced the Directors of the Guncotton Company have written to say, that "whilst they are unable to agree with the conclusions" set forth in the Special Report, "they have, nevertheless, in deference to the wishes of the Home Office," stopped the issue of the pamphlets complained of.

‡ This was one of the articles which, in the passage from the National Encyclopœdia quoted on the footnote next but one above, "are quite as harmless as ordinary percussion caps for fowling pieces." During the past year it will be observed these "harmless" articles occasioned the loss of two lives, and injured six persons.

§ Since this Report was in preparation Laverick has been put on his trial. Although the Judge had charged the grand jury in favour of finding a true bill, the bill was thrown out.

resulted from the application of a lighted match when the percussion cap with which the signal was fitted had failed to explode it.

This closes our list of accidents for 1878, and although our examination of this list has been a somewhat extended one, we believe that the instruction to be derived from such a treatment will justify the time and space which we have devoted to this branch of our subject.

Accident in manufacture of oxygen gas.

Of accidents not properly falling under our official observation, but which nevertheless possess sufficient interest to call for mention in this Report, we have to notice an explosion which occurred on the 16th October, on the premises of Messrs. Wrench and Son, opticians, 39, Gray's Inn Road, by which one man lost his life. Inquiries were instituted by us with regard to this accident, but as it was ascertained to have occurred in the manufacture of oxygen gas for the purposes of illumination in conjunction with hydrogen, the matter was one which did not come under the Explosives Act, 1875, and no further steps were taken by us therein.

Explosion at factory of toy caps in Rue Béranger, Paris.

Of foreign explosions the most remarkable was one which took place in the Rue Béranger, Paris, on the premises of a person who carried on the manufacture of toy caps ("amorces"). The loss of life and property was very considerable; and as the subject of licensing certain places in London for the manufacture of these toy caps has been under our consideration during the year, the explosion was one which possessed for us considerable interest, and we at once made application to be furnished with such particulars as our Ambassador in Paris might be able to obtain. The official report has not yet come into our hands, so that we at present are not in a position to offer any useful observations in regard to this accident, to which we hope to be able to refer more fully in our next Report.

It may, perhaps, be as well to state that in the cases in which toy cap factories have been licensed in this country, the quantities of ingredients and manufactured amorces have been narrowly restricted.

Explosion of dynamite at Fratesti.

A seriously destructive explosion of a Russian dynamite magazine at Fratesti, near Giurgevo, was reported from Bucharest to have occurred on the 7th August, and it is stated that 50 (another account says 55) soldiers were killed, and over 30 injured.

We have, unfortunately, not been able to obtain any details of this serious accident, which, however, is stated to have occurred in the process of loading dynamite from a neighbouring magazine.

Destruction of magazine by lightning at Pottsville, Pennsylvania.

An explosion by lightning of what is described as a "factory" of gunpowder and dynamite, but which we are disposed to think must have been a magazine, is reported to have occurred in the latter end of August or the beginning of September, in Pottsville, Pennsylvania, by which a hundred houses in the neighbourhood are alleged to have been destroyed, and large numbers of persons were killed.

Nitroglycerine explosion at Bradford, Pennsylvania.

In September a nitro-glycerine explosion at Bradford, Pennsylvania, occasioned the deaths of five persons.

Explosion of gunpowder at St. Gothard Tunnel.

A quantity of gunpowder employed in the blasting operations in the St. Gothard tunnel exploded on the 25th September, killing 10 men and injuring many others.

Explosion in a gunpowder factory near Schulau.

In May a serious explosion in a gunpowder factory at Schulau, near Blaukenese, a village on the Elbe, about 10 miles from Hamburg, caused the deaths of about 20 persons.

Explosion in Russian Government cartridge factory, St. Petersburg.

A bad explosion is reported to have occurred on the 21st September, at the Russian Imperial Cartridge Factory at St. Petersburg, by which 17 persons were killed on the spot, and 70 more were injured, 30 of them seriously.

Destruction of Japanese vessel by explosion of gunpowder.

A terrible accident on board a vessel laden with gunpowder is reported to have occurred in Japanese waters about the end of October. The vessel was called the "Tokushima Maru." It was built to ply between Osaka and Arua, and left the former place on its first voyage on the 28th October. At 11 p.m. that day, when off Tsuda, some gunpowder on board exploded, instantly destroying the vessel. The number of lives lost varies in the different accounts from 73 to 90.

We have, &c.

V. D. Majendie,
Major R.A.,

A. Ford,
Major R.A.,

Her Majesty's Inspectors of Explosives.

The Right Honourable
The Secretary of State,
Home Department.

APPENDICES to Annual Report, 1878.

APPENDIX A.

APPLICATIONS for FACTORY and TOY FIREWORK FACTORY LICENSES from 1st January 1878 to 31st December 1878.

Licences.	No. of Applications.		No. rejected during present Year.	No. withdrawn during present Year.	No. under consideration.		No. of Draft Licenses issued with Assent of Secretary of State, and not yet confirmed.		No. confirmed.		
	Old; viz., outstanding at beginning of 1878.	New; viz., submitted during present Year.			Old.	New.	Old.	New.	Old Applications.	New Applications.	Total confirmed.
Factory licenses.	7	10	—	2	—	2	2	4	5	2	7
Toy firework factory licenses.	—	15	—	—	—	—	—	6	—	9	9
	7	25	—	2	—	2	2	10	5	11	16

N.B.—In the above return the expressions "old" and "new" relate respectively to applications which were made previous to 1878, and were outstanding at beginning of the year, and those which have been submitted during the year 1878.

APPENDIX B.

TABLE of FACTORIES,* showing the CLASSES of EXPLOSIVES authorised to be made therein.

Class and Division.		No. of Factories under Continuing Certificate.	No. of Factories under License.		Total No. of Factories.
			Licensed previous to 1878.	Licensed during 1878.	
Class 1. Gunpowder	Factories Nos. 1, 2, 10, 11, 13, 15, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 33, 34, 37, 38, 39, 40, 42, 48, 49, 50, 53.	28†	—	—	28
Class 2. Nitrate Mixture	Factory No. 45	1	—	—	1
	Factory No. 90	—	—	1	1
Class 3. Nitro Compound. Divisions 1 and 2	Factory No. 3	1	—	—	1
" " " " 2	Factories Nos. 9, 14, 36, 52.	4	—	—	4
	Factories Nos. 74, 82	—	2	—	2
" " " " 2, and Class 6 (Ammunition)	Factories Nos. 7, 35	2	—	—	2
Class 4. Chlorate Mixture. Division 1	——	—	—	—	—
" " " " 2	——	—	—	—	—
Class 5. Fulminate. Division 1	Factory No. 12	1	—	—	1
" " " 1, and Class 6 (Ammunition). Division 1	Factory No. 58	—	1	—	1
" Fulminate. Division 2	——	—	—	—	—
Class 6. Ammunition. Division 1	Factories Nos. 6, 44, 51	3	—	—	3
	Factories Nos. 56, 61, 62, 63, 64, 67, 69, 70, 79.	—	9	—	9
" " Divisions 1 and 2	Factory No. 5	1	—	—	1
	Factory No. 60	—	1	—	1
" " " 1, 2, and 3	Factories Nos. 41, 46, 47‡	3	—	—	3
" " Division 2	Factory No. 66	—	1	—	4
	Factories Nos. 75, 77, 81, 88.	—	3	1	
" " Divisions 2 and 3	Factories Nos. 68, 80	—	2	—	2
" " Division 3	Factory No. 18	1	—	—	1
	Factory No. 86	—	—	1	1
" " and Class 7 (Fireworks)	Factory No. 65	—	1	—	1
Class 7. Fireworks. Divisions 1 and 2	Factories Nos. 4, 8, 16, 27, 31, 32, 43, 55.	8‖	—	—	8
	Factories Nos. 57, 59, 72, 73, 76, 78, 83.	—	7§	—	11
	Factories Nos. 84, 85, 87, 89.	—	—	4	
	Total	53	27	7	87

* Not including toy firework factories (for No. of which see Appendix A).
† One factory (No. 17) struck off, the Continuing Certificate having lapsed under sect. 13.
‡ This factory (No. 47) has not yet been erected.
§ One factory (No. 71) given up during 1878.
‖ One factory (No. 54) struck off, the Continuing Certificate having lapsed under sect. 13.

APPENDIX C.

TABLE of EXPLOSIVES authorised to be manufactured and imported, with the number of FACTORIES and TOY FIREWORK FACTORIES in which each may be made.

Class and Name of Explosive.			No. of Factories in which each may be made.		
			Certificated or Licensed previous to 1878.	Licensed in 1878.	Total.
Class 1.	Gunpowder	Factories, Nos. 1, 2, 10, 11, 13, 15, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 33, 34, 37, 38, 39, 40, 42, 48, 49, 50, 53.	28	—	28
Class 2.	Pudrolithe	Factory, No. 45	1	—	1
,,	Espir's Explosive Powder	Factory, No. 90	—	1	1
Class 3.	Division 1. Dynamite (Nos. 1 and 2)	Factory, No. 3	1	—	1
,,	,, *Blasting Gelatine (No. 1)	Nil	—	—	—
,,	Division 2. Guncotton	Factories, Nos. 7, 9, 14,† 35, 74†	5	—	5
,,	,, Nitrated Guncotton	Factories, Nos. 9, 14,† and 74†	3	—	3
,,	,, Cotton Powder	Factory, No. 7	1	—	1
,,	,, Cotton Gunpowder	Factory, No. 35	1	—	1
,,	,, Sawdust and Guncotton Powder.	Factory, No. 35	1	—	1
,,	,, Wood Gunpowder	Factory, No. 82	—	—	1
,,	,, Rifle Guncotton	Factories, Nos. 9, 14,† and 74†	3	—	3
,,	,, Schultze Gunpowder	Factory, No. 36	1	—	1
,,	,, Schultze Blasting Powder	Factory, No. 36	1	—	1
,,	,, Sawdust Gunpowder	Factory, No. 35	1	—	1
,,	,, Collodion Cotton	Factory, No. 3	1	—	1
,,	,, Xylobrome	Factory, No. 52	1	—	1
Class 5.	Division 1. Fulminate of Mercury	Factories, Nos. 12 and 58	2	—	2
Class 6.	Division 1. Safety Cartridges‡	Factories, Nos. 5, 7, 35, 41, 46, 47, 58, 65	8	—	8
,,	,, Safety Fuze	Factories, Nos. 56, 60, 61, 62, 63,§ 67, 69, 70, 79.	9	—	9
,,	,, Railway Fog Signals	Factories, Nos. 41, 44, 46, 64, 65	5	—	5
,,	,, Percussion Caps	Factories, Nos. 6, 41, 46, 47, 51, 58	6	—	6
,,	Division 2. Cartridges for Small Arms‡	Factories, Nos. 5, 41, 44, 47	4	—	4
,,	,, Cartridges for Cannon, Blasting, &c. ‖	Factories, Nos. 46, 47, 65, 75, 77, 81, 88	6	1	7
,,	,, Electric Fuzes	Factories, Nos. 68, 86	1	1	2
,,	,, Instantaneous Fuze	Factory, No. 60	1	—	1
,,	,, Tubes for firing Explosives	Factories, Nos. 65, 80	1	1	2
,,	,, Fuzes for Shells	Factories, Nos. 65, 80	1	1	2
,,	,, Gunpowder Fuzes	Factory, No. 68	1	—	1
,,	,, Guncotton Fuzes	Factory, No. 68	1	—	1
,,	,, War Rockets	Factory, No. 66	1	—	1
,,	Division 3. Detonators	Factories, Nos. 7, 18, 46, 68	3	1	4
,,	,, Cartridges for Small Arms‡	Factories, Nos. 41, 46, 47	3	—	3
,,	,, Tubes for firing Explosives.	Factory, No. 46	1	—	1
		Factories, Nos. 65, 80	1	1	2
,,	,, Electric Detonator Fuzes	Factories, Nos. 68, 86	1	1	2
,,	,, Double Detonator Fuzes	Factory, No. 68	1	—	1
,,	,, Fuzes for Shells	Factories, Nos. 65, 80	1	1	2
Class 7.	Fireworks	Factories, Nos. 4, 8, 16, 27, 31, 32, 43, 55, 57, 59, 65, 72, 73, 76, 78, 83, 84, 85, 87, 89.	16	4	20
		Toy Firework Factories, 1, 2, 3, 4, 5, 6, 7, 8, 9.	—	9	9

APPENDIX D.

DETAIL of APPLICATIONS for FACTORY AMENDING LICENSES, from 1st January to 31st December 1878.

No. of Applications.		No. rejected.	No. withdrawn.		No. in progress.		No. confirmed.		Remarks.
Old; viz., outstanding at beginning of Year.	New; viz., submitted during present Year.		Certificated Factories.	Licensed Factories.	Certificated Factories.	Licensed Factories.	Certificated Factories.	Licensed Factories.	
12	42	—	5	1	13	4	17	14	
54							31		

* At present imported only. It is not made in the United Kingdom.
† Preparing for use only.
‡ Not including "Rooms" used in connexion with Magazines, Stores, or Registered Premises under Section 46.
§ Preparing Gunpowder for use only in the manufacture of safety fuze.
‖ Not including the Factories in which, under Section 44, they may be made without a license, or the "Workshops" used in connexion with Magazines and Stores under Section 47.

APPENDIX E.

TABLE of MAGAZINES, showing the CLASSES of EXPLOSIVES authorised to be stored therein.

Class and Division.		No. of Magazines under Continuing Certificate.	No. of Magazines under License.		Total No. of Magazines.
			Licensed previous to 1878.	Licensed during 1878.	
Class 1. Gunpowder	Magazines, Nos. 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 40, 42, 43, 45, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 60, 61, 62, 66, 67, 68, 69, 70, 72, 73, 74, 76, 77, 78, 79, 80, 81, 82, 83, 84, 87, 88, 89, 90, 91, 93, 94, 99, 100, 102, 103, 104, 105, 106, 107, 108, 109, 111, 112, 113, 114, 115, 116, 117,* 118, 119, 120, 123, 124, 125, 126, 127, 128, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 150, 151, 152, 153, 154, 155, 158, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 177, 179, 181, 183, 184, 186, 188, 190, 192, 193, 194, 196, 198.	154	—	—	209
	Magazines, Nos. 203, 204, 205, 209, 210, 211, 212, 213, 214, 215, 224, 225, 227, 231, 233, 234, 240, 241, 243, 244, 246, 248, 251, 252, 253, 254, 255, 258, 259, 260, 262, 267, 268, 270, 273, 279, 280, 282, 284.	—	89	—	
	Magazines, Nos. 286, 287, 288, 289, 293, 294, 295, 298, 299, 300, 302, 305, 306, 312, 317, 318.	-	—	16	
„ Gunpowder and Safety Cartridges.	Magazines, Nos. 52, 110	2	—	—	7
	Magazines, Nos. 236, 239, 249, 257, 276.	—	5	—	
„ Gunpowder and Safety Fuze	Magazine, No. 178	1	—	—	9
	Magazines, Nos. 238, 256, 272, 281.	—	4	—	
	Magazines, Nos. 290, 308, 309, 310	—	—	4	
„ Gunpowder and Class 6 (Ammunition).	Magazines, Nos. 266, 269	—	2	—	2
„ Gunpowder, Class 3 (Nitro-compound), Class 6 (Ammunition), and Class 7 (Fireworks).	Magazine, No. 197	1	—	—	1
Classes 1 to 4, and Safety Fuze	Magazines, Nos. 206, 217, 271, 275	—	4	—	8
	Magazines, Nos. 285, 296, 311, 313	—	—	4	
Class 2. Nitrate Mixture	Magazine, No. 316	—	—	1	1
Class 3. Nitro-compound. Division 1	Magazines, Nos. 1, 2, 15, 39, 41, 44, 57, 58, 63, 64, 65, 75, 85, 86, 95, 96, 97, 121, 122, 148, 159, 191, 195.	23	—	—	48
	Magazines, Nos. 207, 216, 218, 220, 221, 226, 228, 229, 232, 235, 237, 242, 245, 247, 261, 263, 274, 277.	—	18	—	
	Magazines, Nos. 292, 301, 303, 304, 307, 314, 315.	—	—	7	
„ „ „ Division 1 and Detonators.	Magazine, No. 278	—	1	—	1
„ „ „ Division 1, Detonators and Safety Fuze.	Magazine, No. 291	—	—	1	1
„ „ „ Division 2	Magazine, No. 176	1	—	—	4
	Magazines, Nos. 208, 219, 250	—	3		
„ „ „ Division 2, Detonators and Safety Fuze.	Magazine, No. 264	—	1	—	1
Class 6. Ammunition	Magazine, No. 297	—	—	1	1
„ Ammunition, and Class 7 (Fireworks).	Magazines, Nos. 265, 283	—	2	—	2
	Total	182	79	34	295†

* Safety Cartridges may be substituted for Gunpowder in Magazine 117 under Amending License.

† This does not include a magazine (No. 200) belonging to the Home Office and City Police for seized explosives in Plumstead Marshes, which is exempt from the operation of the Act.

APPENDIX F.

GUNPOWDER MAGAZINES under CONTINUING CERTIFICATES, including those in which AMMUNITION may also be kept.

Not exceeding 2 Tons.	Over 2 Tons, and not exceeding 5 Tons.	Over 5 Tons, and not exceeding 10 Tons.	Over 10 Tons, and not exceeding 25 Tons.	Over 25 Tons, and not exceeding 50 Tons.	Over 50 Tons, and not exceeding 100 Tons.	Over 100 Tons.	Amount not stated.
Index Numbers. 43, 83, 94, 109, 111, 120, 127, 130, 131, 158.	Index Numbers. 18, 36, 70, 134, 143, 160, 162, 174, 190.	Index Numbers. 6, 10, 16, 19, 20, 27, 28, 34, 42, 45, 46, 48, 53, 54, 68, 80, 110, 132, 138, 184, 188, 193, 194, 198.	Index Numbers. 7, 8, 9, 12, 13, 14, 22, 23, 25, 30, 31, 33, 37, 49, 69, 72, 82, 84, 87, 88, 105, 107, 108, 113, 114, 115, 119, 124, 125, 126, 128, 136, 137, 139, 142, 145, 146, 147, 155, 161, 178, 179, 183, 186.	Index Numbers. 3, 4, 5, 17, 21, 24, 26, 29, 32, 35, 40, 52, 55, 56, 62, 67, 74, 76, 79, 89, 90, 93, 99, 102, 103, 106, 116, 118, 141, 150, 154, 167, 169, 171, 173, 177.	Index Numbers. 47, 50, 60, 61, 66, 73, 78, 81, 91, 100, 104, 112, 133, 135, 151, 152, 153, 166, 168, 181.	Index Numbers. 51, 77, 117, 123, 140, 144, 165, 170, 175, 192, 196.	Index Numbers. 163, 164, 172.
Total 10.	Total 9.	Total 24.*	Total 44.†	Total 36.‡	Total 20.	Total 11.§	Total 3.

Grand total 157.

* One magazine, No. 199, given up during 1878.
† Three magazines, Nos. 98, 156, 180, given up during 1878.
‡ One magazine, No. 71, given up during 1878.
§ One magazine, No. 182, given up during 1878.

APPENDIX G.

DYNAMITE, BLASTING GELATINE, and LITHOFRACTEUR MAGAZINES under CONTINUING CERTIFICATES.

Not exceeding 2 Tons.	Over 2 Tons, and not exceeding 5 Tons.	Over 5 Tons, and not exceeding 10 Tons.	Over 10 Tons, and not exceeding 25 Tons.	Over 25 Tons, and not exceeding 50 Tons.
Index Numbers. 41, 65, 75, 85, 96, 97, 148.	Index Numbers. 15, 44, 58, 86, 95 122, 159, 195.	Index Numbers. 1, 2, 39, 63, 121, 191.	Index Number. 57.	Index Number 64.
Total 7.*	Total 8.†	Total 6.‡	Total 1.	Total 1.

Grand total 23.

* Three magazines (Nos. 129, 185, 189) given up during 1878.
† Two magazines (Nos. 59, 157) given up during 1878.
‡ One magazine (No. 101) given up during 1878.

APPENDIX H.

GUNPOWDER MAGAZINES under LICENSE, including those in which AMMUNITION may also be kept.

Not exceeding 2 Tons.	Over 2 Tons, and not exceeding 5 Tons.	Over 5 Tons, and not exceeding 10 Tons.	Over 10 Tons, and not exceeding 25 Tons.	Over 25 Tons, and not exceeding 50 Tons.	Over 50 Tons, and not exceeding 100 Tons.
Index Numbers. 203, 209, 214, 227, 238, 244, 249, 256, 259, 267, 269, 279, 280, 286, 287, 290, 298, 300, 312, 317.	Index Numbers. 205, 211, 212, 213, 215, 225, 233, 234, 239, 240, 241, 246, 248, 251, 252, 253, 260, 263, 268, 270, 273, 276, 281, 294, 295, 305, 306, 309, 310, 318.	Index Nos. 204, 224, 231, 236, 254, 257, 258, 288, 289, 302.	Index Nos. 210, 243, 255, 262, 272, 282, 284, 293.	Index Nos. 308.	Index Nos. 299.
Total 20.	Total 30.	Total 10.	Total 8.	Total 1.	Total 1.

Grand total 70.

APPENDIX I.

DYNAMITE, BLASTING GELATINE, and LITHOFRACTEUR MAGAZINES under LICENSE, including those in which DETONATORS and SAFETY FUZE may also be kept.

Not exceeding 2 Tons.	Over 2 Tons, and not exceeding 5 Tons.	Over 5 Tons, and not exceeding 10 Tons.	Over 10 Tons, and not exceeding 25 Tons.	Over 25 Tons, and not exceeding 50 Tons.
Index Numbers. 228, 229, 247, 261, 301, 314.	Index Numbers. 221, 237, 242, 245, 263, 274, 291, 315.	Index Numbers. 207, 216, 220, 226, 232, 235, 277, 278, 292.	Index Numbers. 303, 304, 307.	Index Number. 218.
Total 6.	Total 8.	Total 9.	Total 3.	Total 1.

Grand total 27.

MAGAZINES for GUNCOTTON, &c., under LICENSE, including those in which DETONATORS and SAFETY FUZE may also be kept.

264.	250.	—	208, 219.	—
Total 1.	Total 1.		Total 2.	

Grand total 4.

APPENDIX K.

DETAIL of APPLICATIONS for MAGAZINE LICENSES, from 1st January to 31st December 1878.

No. of Applications.		No. rejected.		No. withdrawn.		No. under Consideration.		No. of Draft Licenses issued with Assent of Secretary of State, and not yet confirmed.		No. confirmed.			Remarks.
Old; viz., outstanding at beginning of year.	New; viz., submitted during present year.	Old; viz., outstanding at beginning of year.	New; viz., submitted during present year.	Old; viz., outstanding at beginning of year.	New; viz., submitted during present year.	Old; viz., outstanding at beginning of year.	New; viz., submitted during present year.	Old; viz., outstanding at beginning of year.	New; viz., submitted during present year.	Old; viz., outstanding at beginning of year.	New; viz., submitted during present year.	Total confirmed.	
46	32	3	—	16	3	2	7	7	6	18	16	34	
78													

APPENDIX L.

DETAIL of APPLICATIONS for MAGAZINE AMENDING LICENSES, from 1st January to 31st December 1878.

No. of Applications.		No. rejected.	No. withdrawn.		No. in progress.		No. confirmed.			Remarks.
Old; viz., outstanding at beginning of year.	New; viz., submitted during present year.		Certificated Magazines.	Licensed Magazines.	Certificated Magazines.	Licensed Magazines.	Certificated Magazines.	Licensed Magazines.	Total confirmed.	
1	44	1	2	—	—	2	13	27	40	
45										

APPENDIX M.

Distribution in Counties of Factories, Magazines, and Toy Firework Factories.

Counties.	Factories.			Magazines.			Toy Firework Factories.
	Under Continuing Certificate.	Under License.	Total.	Under Continuing Certificate.	Under License.	Total.	
ENGLAND AND WALES.							
Anglesey	—	—	—	2*	1	3	—
Bedford	—	—	—	—	—	—	—
Berks	—	—	—	—	—	—	—
Brecon	—	—	—	—	—	—	—
Buckingham	—	—	—	—	—	—	—
Cambridge	—	—	—	—	—	—	—
Cardigan	—	—	—	4	1	5	—
Carmarthen	—	—	—	1	—	1	—
Carnarvon	—	—	—	5†	6	11	—
Chester	—	—	—	3	3	6	—
Cornwall	5	7	12	10‡	11§	21	—
Cumberland	—	—	—	2	5	7	—
Denbigh	2	1	3	3	2	5	—
Derby	1	1	2	5	4	9	—
Devon	1	1	2	7‖	1	8	—
Dorset	—	—	—	1	—	1	—
Durham	—	—	—	11	3	14	—
Essex	—¶	3	3	7	3	10	—
Flint	—¶	—	—	4	1	5	—
Glamorgan	1	2	3	6	5	11	—
Gloucester	1	1	2	6	1	7	—
Hants	2	—	2	—	—	—	—
Hereford	—	—	—	—	—	—	—
Hertford	—	—	—	—	—	—	—
Huntingdon	—	—	—	—	—	—	—
Kent	7	4	11	2	5	7	—
Lancaster	4	2	6	15	6	21	—
Leicester	—	1	1	1	3	4	—
Lincoln	—	—	—	—	1	1	—
Merioneth	1	—	1	6	5	11	—
Middlesex	4	2	6	1	—	1	9
Monmouth	—	—	—	8	1**	9	—
Montgomery	—	—	—	2	—	2	—
Norfolk	1	—	1	—	—	—	—
Northampton	—	—	—	—	—	—	—
Northumberland	—	1	1	9	1	10	—
Nottingham	—	—	—	2	5	7	—
Oxford	—	—	—	—	—	—	—
Pembroke	—	—	—	2	—	2	—
Radnor	—	—	—	—	—	—	—
Rutland	—	—	—	—	—	—	—
Salop	—	—	—	2	—	2	—
Somerset	—	—	—	2	3	5	—
Stafford	2	1	3	19	1	20	—
Suffolk	1	—	1	—	1	1	—
Surrey	1	4††	5	—	—	—	—
Sussex	1	—	1	—	—	—	—
Warwick	1	1	2	1	—	1	—
Westmoreland	4	—	4	—	—	—	—
Wilts	—	—	—	—	—	—	—
Worcester	2	—	2	1	—	1	—
York	4	—	4	16‡‡	15	31	—
Totals	46	32	78	166	94	260	9

* The Continuing Certificate of magazine No. 182 has been surrendered.
† The Continuing Certificate of magazine No. 156 has been surrendered.
‡ Two magazines, Nos. 129 and 189, have been given up.
§ Magazine No. 230 has been given up, and the licence surrendered.
‖ Magazines Nos. 71, 157, and 185 have been given up, and a Store License has been obtained for No. 199.
¶ The Continuing Certificates for factories Nos. 17 and 54 have been allowed to lapse.
** The License for magazine No. 223 has been surrendered.
†† Factory No. 71 has been given up.
‡‡ The Continuing Certificates for magazines Nos. 59 and 98 have been surrendered.

Counties.	Factories.			Magazines.			Toy Firework Factories.
	Under Continuing Certificate.	Under License.	Total.	Under Continuing Certificate.	Under License.	Total.	
SCOTLAND.							
Aberdeen	—	—	—	1	—	1	—
Argyll	3	—	3	—	—	—	—
Ayr	1	—	1	1	1	2	—
Banff	—	—	—	1	1	2	—
Berwick	—	—	—	—	—	—	—
Bute	—	—	—	—	—	—	—
Caithness	—	—	—	—	—	—	—
Clackmannan	—	—	—	—	1	1	—
Cromarty	—	—	—	—	—	—	—
Dumbarton	—	—	—	—	—	—	—
Dumfries	—	—	—	—	—	—	—
Edinburgh	1	—	1	3	—	3	—
Elgin	—	—	—	2	—	2	—
Fife	—	—	—	2	3	5	—
Forfar	—	—	—	—	2	2	—
Haddington	—	—	—	—	—	—	—
Inverness	—	—	—	—	1	1	—
Kincardine	—	—	—	—	—	—	—
Kinross	—	—	—	—	—	—	—
Kirkcudbright	—	—	—	—	—	—	—
Lanark	—	1	1	2	1	3	—
Linlithgow	—	—	—	—	1	1	—
Nairn	—	—	—	—	—	—	—
Orkney and Shetland	—	—	—	—	—	—	—
Peebles	—	—	—	—	—	—	—
Perth	—	—	—	—*	1	1	—
Renfrew	—	—	—	1	—	1	—
Ross	—	—	—	—	—	—	—
Roxburgh	—	—	—	—	—	—	—
Selkirk	—	—	—	—	—	—	—
Stirling	1	—	1	1	2	3	—
Sutherland	—	—	—	—	—	—	—
Wigton	—	—	—	—	—	—	—
Totals	6	1	7	14	14	28	—
IRELAND.							
Antrim	—	—	—	—	1	1	—
Armagh	—	—	—	—	—	—	—
Carlow	—	—	—	—	—	—	—
Cavan	—	—	—	—	—	—	—
Clare	—	—	—	—	—	—	—
Cork	1	—	1	—	3	3	—
Donegal	—	—	—	—	—	—	—
Down	—	—	—	1	—	1	—
Dublin	—	1	1	—	—	—	—
Fermanagh	—	—	—	—	—	—	—
Galway	—	—	—	1	—	1	—
Kerry	—	—	—	—	—	—	—
Kildare	—	—	—	—	—	—	—
Kilkenny	—	—	—	—	—	—	—
King's County	—	—	—	—	—	—	—
Leitrim	—	—	—	—	—	—	—
Limerick	—	—	—	—	—	—	—
Londonderry	—	—	—	—	1	1	—
Longford	—	—	—	—	—	—	—
Louth	—	—	—	—	—	—	—
Mayo	—	—	—	—	—	—	—
Meath	—	—	—	—	—	—	—
Monaghan	—	—	—	—	—	—	—
Queen's County	—	—	—	—	—	—	—
Roscommon	—	—	—	—	—	—	—
Sligo	—	—	—	—	—	—	—
Tipperary	—	—	—	—	—	—	—
Tyrone	—	—	—	—	—	—	—
Waterford	—	—	—	—	—	—	—

* The Continuing Certificate for magazine No. 180 has been surrendered.

Counties.	Factories.			Magazines.			Toy Firework Factories.
	Under Continuing Certificate.	Under License.	Total.	Under Continuing Certificate.	Under License.	Total.	
IRELAND—*cont.*							
Westmeath	—	—	—	—	—	—	—
Wexford	—	—	—	—	—	—	—
Wicklow	—	—	—	—*	—	—	—
Totals	1	1	2	2	5	7	—
SUMMARY.							
ENGLAND AND WALES	46	32	78	166	94	260	9
SCOTLAND	6	1	7	14	14	28	—
IRELAND	1	1	2	2	5	7	—
Grand Totals	53†	34‡	87	182§	113‖	295	9

* The Continuing Certificate of magazine No. 101 has been surrendered.
† Two factories under Continuing Certificate have ceased to exist during the year 1878.
‡ Eleven factories were licensed in 1876, seventeen in 1877, and seven in 1878. One has been given up, leaving 34 now in existence.
§ Twelve magazines under Continuing Certificate have ceased to exist as such during the year 1878.
‖ Thirty-four new magazines were licensed in 1878. Two licenses (granted in 1876) have been surrendered.

APPENDIX N.

DISTRIBUTION in COUNTIES of STORES, SMALL FIREWORK FACTORIES, and REGISTERED PREMISES.

Counties.	Stores.			Small Firework Factories.	Registered Premises.	Remarks
	Under Continuing Certificate.	Under License.	Total.			
ENGLAND AND WALES.						
Anglesey	—	3	3	—	11	
Bedford	—	—	—	—	48	
Berks	—	1	1	—	46	
Brecon	—	7	7	—	26	
Buckingham	—	—	—	—	126	Return in progress, P.S.D. 9.
Cambridge	—	—	—	1	79	
Cardigan	—	26	26	—	20	
Carmarthen	1	11	12	—	145	
Carnarvon	15	49	64	—	47	
Chester	6	12	18	—	194	
Cornwall	42	72	114	—	89	
Cumberland	13	72	83	—	77	
Denbigh	—	34	35	—	21	
Derby	31	52	84	1	376	
Devon	—	36	36	—	217	
Dorset	—	3	3	—	64	
Durham	28	71	99	—	502	
Essex	—	2	2	7	218	
Flint	10	20	30	—	21	
Glamorgan	4	48	52	—	155	
Gloucester	3	23	26	3	337	
Hants	—	4	4	1	142	
Hereford	—	2	2	—	19	
Hertford	—	—	—	—	68	
Huntingdon	—	—	—	—	19	
Kent	—	4	4	—	219	
Lancaster	75	83	158	4	1,508	
Carried forward	228	635	863	17	4,794	

Counties.	Stores.			Small Firework Factories.	Registered Premises.	Remarks.
	Under Continuing Certificate.	Under License.	Total.			
ENGLAND AND WALES—*cont.*						
Brought forward -	228	635	863	17	4,794	
Leicester - - -	10	23	33	—	86	
Lincoln - - -	4	1	5	—	133	
Merioneth - - -	15	28	43	—	16	
Middlesex - - -	—	3	3	7	1,948	
Monmouth - - -	5	4	9	—	92	
Montgomery - -	13	12	25	—	54	
Norfolk - - -	—	5	5	—	302	
Northampton - -	—	10	10	1	142	
Northumberland - -	32	37	69	—	137	
Nottingham - - -	1	33	34	—	76	
Oxford - - -	—	—	—	—	72	
Pembroke - - -	—	1	1	—	37	Return in progress, several harbours (Admiralty returns).
Radnor - - -	—	1	1	—	7	
Rutland - - -	—	1	1	—	14	
Salop - - -	15	20	35	—	86	
Somerset - - -	—	26	26	1	221	
Stafford - - -	91	68	159	1	229	
Suffolk - - -	—	2	2	—	205	
Surrey - - -	—	2	2	—	217	
Sussex - - -	—	4	4	1	330	
Warwick - - -	11	18	29	4	424	
Westmorland - - -	3	7	10	—	22	
Wilts - - -	—	1	1	—	72	
Worcester - - -	5	8	13	1	124	
York - N.R. - -	25	20	45	—	140	
York - E.R. - -	—	2	2	1	144	
York - W.R. - -	50	90	140	—	1,272	
Totals - -	508	1,062	1,570	34	11,396	
SCOTLAND.						
Aberdeen - - -	1	24	25	—	102	
Argyll - - -	4	10	14	—	5	
Ayr - - -	11	57	68	—	209	
Banff - - -	—	8	8	—	49	
Berwick - - -	—	—	—	—	21	
Bute - - -	—	—	—	—	—	
Caithness - - -	—	2	2	—	11	
Clackmannan - -	—	2	2	—	18	
Cromarty - - -	—	—	—	—	—	Included in returns from *Ross*.
Dumbarton - -	2	8	10	—	13	
Dumfries - - -	—	10	10	—	40	
Edinburgh - -	12	9	21	1	113	
Elgin - - -	—	—	—	—	16	
Fife - - -	6	11	17	—	70	
Forfar - - -	—	7	7	—	78	
Haddington - - -	—	2	2	—	14	
Inverness - - -	—	—	—	—	40	
Kincardine - - -	—	—	—	—	—	
Kinross - - -	—	—	—	—	7	
Kirkcudbright - -	—	15	15	—	10	
Lanark - - -	4	41	45	—	175	
Linlithgow - - -	4	15	19	—	40	
Nairn - - -	—	—	—	—	2	
Orkney and - - -	—	—	—	—	20	
Shetland - - -	1	1	2	—	—	
Peebles - - -	—	—	—	—	—	
Perth - - -	—	1	1	—	32	
Renfrew - - -	3	14	17	—	23	
Ross - - -	—	—	—	—	14	
Roxburgh - - -	—	—	—	—	20	
Selkirk - - -	—	2	2	—	8	
Stirling - - -	—	8	8	—	52	
Sutherland - - -	—	3	3	—	15	
Wigtown - - -	—	—	—	—	3	
Totals - -	48	250	298	1	1,220	

Counties.	Stores. Under Continuing Certificate.	Stores. Under License.	Stores. Total.	Small Firework Factories.	Registered Premises.	Remarks.
IRELAND.						
Antrim	2	20	22	—	46	
Armagh	—	—	—	—	35	
Carlow	—	—	—	—	19	
Cavan	—	2	2	—	10	
Clare	—	4	4	—	9	
Cork	—	3	3	—	25	
Donegal	—	5	5	—	33	
Down	—	4	4	—	32	
Dublin	—	1	1	—	25	
Fermanagh	—	7	7	—	15	
Galway	—	4	4	—	12	
Kerry	—	—	—	—	7	
Kildare	—	—	—	—	10	
Kilkenny	—	4	4	—	8	
King's County	—	8	8	—	13	
Leitrim	—	—	—	—	4	
Limerick	—	3	3	—	1	
Londonderry	—	1	1	—	15	
Longford	—	1	1	—	3	
Louth	—	—	—	—	13	
Mayo	—	4	4	—	15	
Meath	—	—	—	—	17	
Monaghan	—	—	—	—	14	
Queen's County	—	1	1	—	16	
Roscommon	—	2	2	—	11	
Sligo	—	—	—	—	2	
Tipperary	—	6	6	—	20	
Tyrone	—	11	11	—	42	
Waterford	—	3	3	—	7	
Westmeath	—	—	—	—	16	
Wexford	—	2	2	—	20	
Wicklow	4	3	7	—	15	
Totals	6	99	105	—	530	
SUMMARY.						
England and Wales	508	1,062	1,570	34	11,396	
Scotland	48	250	298	1	1,220	
Ireland	6	99	105	—	530	
Grand Totals	562	1,411	1,973	35	13,146	

APPENDIX O.

List of Canal Companies the Byelaws of which have been confirmed, and of the Companies which decline to carry Explosives, up to 31st December 1878.

Initial Letter of Country.	Name of Canal, &c.	Date of Sanction of Byelaws. Previous to 1878.	Date of Sanction of Byelaws. During 1878.	Explosives not carried. Previous to 1878.	Explosives not carried. During 1878.	Remarks.
E.	Aberdare Canal	5/8/76	—	—	—	
E.	Aire and Calder Navigation	7/11/76	—	—	—	Including the Port of Goole.
E.	Ancholme Drainage and Navigation	30/10/76	—	—	—	
E.	Ashton-under-Lyne Canal	13/11/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Avon River	—	—	1	—	
E.	Arun Navigation	31/12/77	—	—	—	

Initial Letter of Country.	Name of Canal, &c.	Date of Sanction of Byelaws.		Explosives not carried.		Remarks.
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	
E.	Ashby-de-la-Zouch Canal	2/7/77	—	—	—	Property of Midland Railway Company.
E.	Barnsley Canal	—	—	—	—	Included in Aire and Calder Navigation Company, to whom it has been conveyed under power given by Act of Parliament.
E.	Birmingham Canal Navigation	21/12/76	—	—	—	
E.	Bridgewater Navigation, Limited	21/6/76	—	—	—	Includes Runcorn Harbour.
E.	Bude Canal	—	—	1	—	
E.	Beverley Beck	7/7/76	—	—	—	
E.	Bure, Yare, and Waveney Rivers	—	—	—	—	Included in byelaws made by Great Yarmouth Port and Haven Commissioners.
I.	Barrow Navigation	—	—	1	—	
E.	Birmingham and Liverpool Junction Canal.	21/4/77	—	—	—	Property of Shropshire Union Railway Company.
E.	Brecon and Abergavenny Canal	17/1/77	—	—	—	Property of Monmouthshire Railway and Canal Company.
E.	Bridgewater and Taunton Canal	11/4/77	—	—	—	Property of Great Western Railway Company.
E.	Calder and Hebble Navigation	17/9/76	—	—	—	
S.	Caledonian Canal	22/12/76	—	—	—	
E.	Chelmer and Blackwater Navigation	4/7/76	—	—	—	
E.	Chesterfield Canal	13/11/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
S.	Crinan Canal	—	—	—	—	Included in Caledonian Canal.
E.	Coventry Canal	23/2/77	—	—	—	
E.	Cromford Canal	2/7/77	—	—	—	
E.	Chester Canal	21/4/77	—	—	—	Property of Shropshire Union Railway Company.
E.	Dearne and Dove Canal	13/11/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Driffield Canal	—	—	1	—	
E.	Droitwich Canal	22/6/76	—	—	—	Property of Sharpness New Docks and Birmingham Navigation Company.
E.	Droitwich Junction Canal	22/6/76	—	—	—	
E.	Dun River Navigation	13/11/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Derby Canal	21/4/77	—	—	—	
E.	Derwent River	13/8/77	—	—	—	
S.	Edinburgh and Glasgow Union Canal	—	—	1	—	Property of North British Railway Company.
E.	Erewash Canal	8/7/76	—	—	—	
E.	Exe River and Exeter Canal (Exeter Canal, and within that portion of the Port of Exeter situate within the Cheekstone Rock, except such portions thereof as are included within the prescribed limits of the Exe Bight Pier Company and the Exmouth Dock Company.)	1/8/76	—	—	—	
E.	Ellesmere and Chester Canal	21/4/77	—	—	—	Property of Shropshire Union Railway.
E.	Fossdyke Navigation	27/10/76	—	—	—	Property of Great Northern Railway Company.
S.	Forth and Clyde Canal	11/5/77	—	—	—	
E.	Gipping River	—	—	—	—	Property of Great Eastern Railway Company. Included in Stowmarket Navigation.
E.	Glamorganshire Canal	5/8/76	—	—	—	
E.	Glasgow, Paisley, and Johnstone Canal.	10/6/76	—	—	—	Property of Glasgow and South-Western Railway Company.
E.	Gloucester and Berkeley Canal	22/6/76	—	—	—	Property of Sharpness New Dock and Birmingham Navigation Company.
E.	Grand Surrey Canal	—	—	1	—	Included in Surrey Commercial Dock Company, who absolutely prohibit the introduction of explosives.

Initial Letter of Country.	Name of Canal, &c.	Date of Sanction of Byelaws.		Explosives not carried.		Remarks.
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	
E.	Grand Union Canal	28/6/76	—	—	—	
E.	Grantham Canal	27/10/76	—	—	—	Property of Great Northern Railway Company.
I.	Grand Canal	11/8/76	—	—	—	
E.	Grand Western Canal	11/4/77	—	—	—	
E.	Hereford and Gloucester Canal	11/4/77	—	—	—	Property of Great Western Railway Company.
E.	Horncastle Navigation	—	—	1	—	
E.	Huddersfield and Manchester Canal	24/6/76	—	—	—	Property of London and North-Western Railway Company.
E.	Kennet and Avon Canal (including River Avon from Bath to Hanham Mills).	11/4/77	—	—	—	
E.	Lancaster Canal	24/6/76	—	—	—	Property of London and North-Western Railway Company.
E.	Leeds and Liverpool Canal (the Leeds and Liverpool Canal, the Leigh branch thereof, the South Level of the Lancaster Canal and the Douglas Navigation).	13/11/76	—	—	—	
E.	Leicester Navigation	8/7/76	—	—	—	
E.	Leicestershire and Northampton Union Canal.	21/6/76	—	—	—	
E.	Leven Canal	—	—	1	—	
E.	Loughborough Navigation	8/7/76	—	—	—	
I.	Lagan Navigation	13/12/76	—	—	—	
E.	Lee River	—	—	—	—	All explosives conveyed in Government barges.
E.	Louth Canal	18/9/77	—	—	—	
E.	Middle Level Navigation	14/12/76	—	—	—	
E.	Macclesfield Canal	13/12/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Manchester, Bolton, and Bury Canal	—	23/3/78	—	—	Property of Lancashire and Yorkshire Railway Company.
E.	Market Weighton Canal	30/10/77	—	—	—	Property of North-Eastern Railway Company.
E.	Medway Navigation	5/2/77	—	—	—	
E.	Mersey and Irwell Navigation	1/9/77	—	—	—	Property of Bridgwater Navigation Company, Limited.
S.	Monkland Canal	—	—	—	—	Included in Forth and Clyde.
E.	Monmouthshire Canal	17/1/77	—	—	—	Property of Monmouthshire Railway and Canal Company.
E.	Montgomeryshire Canal	21/4/77	—	—	—	Property of Shropshire Union Railway Company.
E.	Newark Navigation	8/12/76	—	—	—	
E.	Neath Canal	28/9/76	—	—	—	
E.	Nene Valley Drainage and Navigation (2nd District).	19/8/76	—	—	—	
E.	Nene Navigation (3rd Division)	20/12/76	—	—	—	
E.	North Walsham and Dilham Canal	—	—	1	—	
E.	Nottingham Canal	27/10/76	—	—	—	Property of Great Northern Railway Company.
E.	Nutbrook Canal	25/9/76	—	—	—	
I.	Newry Navigation	8/9/76	—	—	—	
E.	Newcastle-under-Lyne Canal	10/8/77	—	—	—	Property of North Staffordshire Railway Company.
E.	North Wiltshire Canal	—	—	—	—	Included in Wilts and Berks Canal.
E.	Norwich and Lowestoft Navigation and Haddiscoe Cut.	1/2/77	—	—	—	Property of Great Eastern Railway Company.
E.	Old Chester Canal	21/4/77	—	—	—	Property of Shropshire Union Railway Company.
E.	Oxford Canal	12/9/77	—	—	—	
E.	Ouse River, Sussex	—	—	—	—	Included in Newhaven Harbour.
E.	Ouse River, York	12/8/77	—	—	—	York Corporation Conservators, and Trustees.
E.	Peak Forest Canal	13/11/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Portsmouth and Arundel Canal	—	—	1	—	
E.	Pocklington Canal	30/10/77	—	—	—	Property of North-Eastern Railway Company.

Initial Letter of Country.	Name of Canal, &c.	Date of Sanction of Byelaws.		Explosives not carried.		Remarks.
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	
E.	Regent's Canal (including Hertford Union Canal, Limehouse Basin, and the City Road Basin).	17/1/77	—	—	—	
E.	Rochdale Canal	16/1/77	—	—	—	
E.	Ramsden's (Sir John) Canal	24/6/76	—	—	—	Property of London and North-Western Railway Company.
I.	Royal Canal	21/9/76	—	—	—	Property of Midland Great Western Railway Company, Ireland.
E.	St. Helen's Canal	24/6/76	—	—	—	Property of London and North-Western Railway Company.
E.	Sheffield Canal	13/11/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Severn Navigation Company	23/5/76	—	—	—	
E.	Sleaford Navigation	—	—	1	—	
E.	Staffordshire and Worcestershire Canal.	7/6/76	—	—	—	
E.	Stainforth and Keadby Canal	13/11/76	—	—	—	Property of Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Stowmarket and Ipswich Navigation	7/12/76	—	—	—	Property of Great Eastern Railway Company.
E.	Stover Canal	11/4/77	—	—	—	
E.	Swansea Canal	11/4/77	—	—	—	
E.	Shrewsbury Canal	21/4/77	—	—	—	Property of Shropshire Union Railway Company.
E.	Stourbridge Canal	21/7/76	—	—	—	
E.	Stourbridge Extension Canal	11/4/77	—	—	—	Property of Great Western Railway Company.
E.	Stort River	14/8/77	—	—	—	
E.	Stroudwater Navigation	8/12/76	—	—	—	
E.	Stratford-upon-Avon Canal	11/4/77	—	—	—	Property of Great Western Railway Company.
E.	Thames and Severn Canal	4/7/76	—	—	—	
E.	Trent River	7/12/76	—	—	—	
E.	Trent and Mersey Canal	10 8/77	—	—	—	Property of North Staffordshire Railway Company.
E.	Tennant Canal	31/1/77	—	—	—	
E.	Ure River	30/10/77	—	—	—	North-Eastern Railway Company.
E.	Ulverstone Canal	14/12/76	—	—	—	Property of Furness Railway Company.
E.	Wisbech Canal	5/8/76	—	—	—	
E.	Witham River	27/10/76	—	—	—	Property of Great Northern Railway Company.
E.	Worcester and Birmingham Navigation.	22/6/76	—	—	—	Property of Sharpness New Docks and Birmingham Navigation Company.
E.	Wiltshire and Berkshire Canal	10/1/77	—	—	—	
I.	Lower Boyne Navigation	—	18/9/78	—	—	Property of the Commissioners of Public Works in Ireland.
I.	Margui Navigation	—	12/9/78	—	—	
I.	Shannon Navigation	—	12/9/78	—	—	
I.	Tyrone Navigation	—	12/9/78	—	—	
I.	Ulster Canal	—	12/9/78	—	—	

SUMMARY.

	Byelaws made regulating General Traffic.		Do not carry Explosives.		Total Canals provided for.	Remarks.
	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.		
ENGLAND	87	2	9	—	98	
SCOTLAND	4	—	1	—	5	
IRELAND	4	5	1	—	10	
TOTAL	95	7	11	—	113	

APPENDIX P.

LIST of RAILWAY COMPANIES the BYELAWS of which have been CONFIRMED, and of those Railway Companies which refuse to carry Explosives, up to 31st December 1878.

Initial Letter of Country.	Name of Company.	Date of Sanction of Byelaws.		Explosives not carried.		Remarks.
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	
E.	Bishop's Castle	14/12/76	—	—	—	
E.	Brecon and Merthyr Tydfil Junction.	30/10/76	—	—	—	
I.	Belfast and County Down	12/3/77	—	—	—	
I.	Belfast and Northern Counties	2/2/77	—	—	—	
I.	Ballymena and Larne	—	17/6/78	—	—	
I.	Carrickfergus and Larne	10/2/77	—	—	—	Part of system of Belfast and Northern Counties Railway Company.
E.	Cambrian	10/10/76	—	—	—	
E.	Central Wales and Carmarthen Junction.	25/10/76	—	—	—	
E.	Cheshire Lines Committee	21/10/76	—	—	—	Joint property of Midland, Great Northern, and Manchester, Sheffield, and Lincolnshire Railway Company.
E.	Cockermouth, Keswick, and Penrith	18/11/76	—	—	—	
S.	Caledonian	30/10/76	—	—	—	
S.	City of Glasgow Union	30/10/76	—	—	—	
E.	Cowes and Newport	7/3/77	—	—	—	
E.	Denbigh, Ruthin, and Corwen	25/1/77	—	—	—	
I.	Downpatrick, Dundrum, and Newcastle.	17/4/77	—	—	—	Worked by Belfast and County Down.
I.	Dublin, Wicklow, and Wexford	26/3/77	—	—	—	
I.	Dundalk, Newry, and Greenore	9/5/77	—	—	—	Property of London and North-Western.
E.	East and West Junction	4/12/76	—	—	—	
E.	Festiniog	10/1/77	—	—	—	
E.	Festiniog and Blaenau	—	—	1	—	
E.	Furness	4/11/76	—	—	—	
I.	Finn Valley	26/3/77	—	—	—	
E.	Great Eastern	7/12/76	—	—	—	
E.	Great Northern	27/10/76	—	—	—	
I.	Great Northern of Ireland	26/3/77	—	—	—	
I.	Great Southern and Western of Ireland.	10/2/77	—	—	—	
S.	Glasgow and South-Western	30/10/76	—	—	—	
S.	Glasgow, Barrhead, and Kilmarnock Joint.	30/10/76	—	—	—	
S.	Glasgow and Paisley Joint	30/10/76	—	—	—	
S.	Great North of Scotland	4/10/76	—	—	—	
E.	Great Western	18/1/77	—	—	—	
I.	Grivan and Portpatrick	20/8/77	—	—	—	
S.	Highland	22/1/77	—	—	—	
E.	Isle of Wight	7/6/77	—	—	—	
E.	Lancashire and Yorkshire	—	—	1	—	
E.	London and North Western	30/10/76	—	—	—	
E.	London and North Western and Furness Joint Railways.	20/8/77	—	—	—	
E.	London and North Western and Rhymney Joint Railways.	11/12/76	—	—	—	
E.	London and North Western and Midland Joint (Ashby and Nuneaton).	9/12/76	—	—	—	
E.	London and South Western	30/10/76	—	—	—	
E.	London, Brighton, and South Coast	14/12/76	—	—	—	
E.	London, Chatham, and Dover	6/2/77	—	—	—	
E.	Londonderry (Seaham to Sunderland).	2/5/77	—	—	—	
E.	London, Tilbury, and Southend	9/2/77	—	—	—	
E.	London and North Western and Great Western Joint Railways.	27/1/77	—	—	—	
E.	Macclesfield Committee	21/10/76	—	—	—	
E.	Manchester, Sheffield, and Lincolnshire.	30/10/76	—	—	—	
E.	Manchester, South Junction and Altrincham.	—	—	1	—	

Initial Letter of Country.	Name of Company.	Date of Sanction of Byelaws.		Explosives not carried.		Remarks.
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	
E.	Maryport and Carlisle	10/11/76	—	—	—	
E.	Metropolitan and Metropolitan District.	—	—	2	—	
E.	Midland	8/12/76	—	—	—	
E.	Midland—Great Western	13/3/77	—	—	—	
E.	Mid-Wales	27/10/76	—	—	—	
E.	Monmouthshire	7/11/76	—	—	—	
E.	Manchester and Milford	17/1/77	—	—	—	
E.	Mawddwy	13/4/77	—	—	—	
E.	Neath and Brecon	24/10/76	—	—	—	
E.	North Eastern	13/10/76	—	—	—	
E.	North London	—	—	1	—	
E.	North Staffordshire	20/9/76	—	—	—	
S.	North British	30/10/76	—	—	—	
E.	Northampton and Banbury Junction	13/2/77	—	—	—	
E.	Oldham, Ashton-under-Lyne, and Guide Bridge Junction.	21/10/76	—	—	—	
E.	Pembroke and Tenby	17/1/77	—	—	—	
E.	Potteries, Shrewsbury, and North Wales.	1/1/77	—	—	—	
E.	Preston and Wyre (London and North Western and Yorkshire Joint Railway).	—	—	—	1	
E.	Rhymney	6/10/76	—	—	—	
E.	Ryde and Newport	9/2/77	—	—	—	
E.	Stafford and Uttoxeter	—	—	1	—	
E.	Sheffield and Midland Companies Joint Committee.	7/12/76	—	—	—	
E.	Scotswood, Newburn, and Wylam	20/1/77	—	—	—	
E.	South Eastern	28/2/77	—	—	—	
E.	Severn and Wye	—	17/6/78	—	—	
E.	Tallyllyn	20/1/77	—	—	—	
E.	Taff Vale	30/9/76	—	—	—	
E.	Thetford and Watton	4/10/76	—	—	—	
E.	Torbay and Brixham	27/11/76	—	—	—	
E.	Trent, Ancholme, and Grimsby	7/12/76	—	—	—	
E.	Vale of Towy Joint Railway (London and North Western and Llanelly Railway Companies).	9/12/76	—	—		
E.	Van	3/3/77	—	—	—	
E.	West London Extension	8/12/76	—	—	—	Property of London and North-Western, Great Western, London, Brighton, and South Coast, and London and South-Western Railway Companies.
E.	West Somerset Mineral	8/12/76	—	—	—	
E.	Whitehaven, Cleator, and Egremont	12/10/76	—	—	—	
I.	Waterford and Tramore	—	—	1	—	
E.	Wrexham, Mold, and Connah's Quay.	29/5/77	—	—	—	
S.	Wigtownshire	20/1/77	—	—	—	
I.	Waterford and Central Ireland	5/1/77	—	—	—	
I.	Waterford and Limerick	2/2/77	—	—	—	
I.	Athenry and Ennis Junction	5/3/77	—	—	—	Leased to the Waterford and Limerick Company.
I.	Athenry and Tuam	5/3/77	—	—	—	
I.	Rathkeale and Newcastle Junction	5/3/77	—	—	—	

Summary.

	Byelaws made regulating General Traffic.		Do not carry Explosives		Total Railways provided for.	Remarks.
	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.		
England	55	2	7	1	65	
Scotland	9	—	—	—	9	
Ireland	16	1	—	—	17	
Total	80	3	7	1	91	

APPENDIX Q.

HARBOURS for which BYELAWS have been made, and HARBOURS in which the TRAFFIC in EXPLOSIVES has been prohibited, up to 31st December 1878.

Initial Letter of Country in which Harbour is situated.	Place.	Under Explosives Act.						Where either (*a*) No Trade in Explosives exists; or (*b*) where such Traffic has been prohibited by Powers other than the Explosives Act.	
		Byelaws made regulating General Traffic		Byelaws made limiting Traffic to 30 lbs.		Byelaws made prohibiting Traffic			
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.
S.	Aberdour	—	—	—	—	—	—	1	—
I.	Annalong	1	—	—	—	—	—	—	—
S.	Anstruther	—	—	—	—	1	—	—	—
I.	Ardglass	—	—	—	—	1	—	—	—
E.	Arundel (including Littlehampton).	1	—	—	—	—	—	—	—
I.	Arklow	—	1	—	—	—	—	—	—
S.	Aberdeen	1	—	—	—	—	—	—	—
E.	Aberystwith	1	—	—	—	—	—	—	—
E.	Aberdovey	1	—	—	—	—	—	—	—
I.	Ballywalter	1	—	—	—	—	—	—	—
S.	Balmerino	—	—	—	—	1	—	—	—
S.	Banff	—	—	—	—	1	—	—	—
I.	Bangor (County Down)	—	—	—	—	1	—	—	—
E.	Barrow Docks and Harbour	—	1	—	—	—	1*	—	—
I.	Belfast	1	—	—	—	—	—	—	—
E.	Blakeney	—	—	—	—	—	—	1	—
E.	Boston	—	—	—	—	1	—	—	—
S.	Bowling Bay Wharf	—	—	—	—	—	—	1	—
E.	Bridport	—	—	—	—	—	—	1	—
E.	Bristol	1	—	—	—	—	—	—	—
E.	Broadstairs	—	—	—	—	1	—	—	—
S.	Brora	—	—	—	—	—	—	1	—
S.	Buckhaven	—	—	—	—	1	—	—	—
E.	Bude Haven	—	—	—	—	—	—	1	—
E.	Burry Navigation (*see* Llanelly)	1	—	—	—	—	—	—	—
I.	Burton Port	—	—	—	—	—	—	1	—
I.	Balbriggan	1	—	—	—	—	—	—	—
E.	Barmouth	1	—	—	—	—	—	—	—
S.	Blackpots	—	—	—	—	1	—	—	—
E.	Blyth Harbour and Docks	1	—	—	—	—	—	—	—
I.	Ballynass	—	—	1	—	—	—	—	—
S.	Burntisland	—	1	—	—	—	—	—	—
I.	Buncrana	—	—	1	—	—	—	—	—
I.	Bruckless	—	—	1	—	—	—	—	—
S.	Burghead	—	—	—	—	1	—	—	—
E.	Bridlington	1	—	—	—	—	—	—	—
I.	Carnlough	1	—	—	—	—	—	—	—
S.	Castlehill	—	—	—	—	—	—	1	—
E.	Cattewater	1	—	—	—	—	—	—	—
E.	Chepstow	—	—	—	—	1	—	—	—
E.	Clovelly	—	—	—	—	1	—	—	—
E.	Cowes, including Newport, Isle of Wight.	1	—	—	—	—	—	—	—
I.	Courtown	—	—	—	—	—	—	1	—
E.	Carnarvon	1	—	—	—	—	—	—	—
S.	Charlestown	—	—	—	—	1	—	—	—
S.	Clyde, Lower Estuary	1	—	—	—	—	—	—	—
S.	Clyde Navigation	—	1	—	—	—	—	—	—
I.	Clonakilty	1	—	—	—	—	—	—	—
I.	Carrickfergus	1	—	—	—	—	—	—	—
S.	Cullen	—	—	—	—	1	—	—	—
I.	Cork	1	—	—	—	—	—	—	—
E.	Conway	1	—	—	—	—	—	—	—
S.	Crail	—	—	—	—	1	—	—	—
E.	Colchester	1	—	—	—	—	—	—	—
S.	Dalbeattie	—	—	—	—	—	—	1	—
	Carried forward	23	4	3	—	15	1	10	—

* Barrow Docks (not Barrow Harbour) appeared in former list of places where explosives were prohibited, and again in Bye Laws approved 24/9/78.

Initial Letter of Country in which Harbour is situated.	Place.	Under Explosives Act.						Where either (*a*) No Trade in Explosives exists; or (*b*) where such Traffic has been prohibited by Powers other than the Explosives Act.	
		Byelaws made regulating General Traffic		Byelaws made limiting Traffic to 30 lbs.		Byelaws made prohibiting Traffic			
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.
	Brought forward	23	4	3	—	15	1	10	—
I.	Donaghadee	—	1	—	—	—	—	—	—
E.	Dover (Government Pier)	—	—	—	—	1	—	—	—
I.	Dunmore	—	1	—	—	—	—	—	—
S.	Drumore	—	—	—	—	—	—	1	—
S.	Dundee	—	—	1	—	—	—	—	—
I.	Dundalk	—	1	—	—	—	—	—	—
I.	Dublin	1	—	—	—	—	—	—	—
E.	Dover Harbour	—	—	1	—	—	—	—	—
S.	Dysart	—	—	—	—	1	—	—	—
I.	Dundrum	—	—	—	—	1	—	—	—
I.	Drogheda	1	—	—	—	—	—	—	—
E.	East and West India Dock	—	—	—	—	1	—	—	—
E.	Exeter and Exmouth	1	—	—	—	—	—	—	—
E.	Falmouth	1	—	—	—	—	—	—	—
E.	Faversham	1	—	—	—	—	—	—	—
S.	Fisherrow	—	—	—	—	—	—	1	—
E.	Fleetwood	—	—	—	—	1	—	—	—
S.	Fort William	—	—	1	—	—	—	—	—
E.	Fowey	1	—	—	—	—	—	—	—
S.	Fraserburgh	—	—	—	—	1*	—	—	—
S.	Frisky Wharf	1†	—	—	—	—	—	—	—
S.	Forth and Clyde Navigation (including Bowling Harbour and Harbour and Docks of Grangemouth.)	—	—	—	—	—	—	1	—
S.	Forth Navigation. (For that part of the river Forth situated between Alloa and Stirling.)	—	—	—	—	—	1	—	—
S.	Findochty	—	—	—	—	1	—	—	—
S.	Garmouth or Kingston	—	—	—	—	1	—	—	—
S.	Gatehouse or Port McAdam	—	—	—	—	1	—	—	—
E.	Goole	1	—	—	—	—	—	—	—
S.	Gourdan	—	—	—	—	—	—	1	—
S.	Guardbridge	—	—	—	—	—	—	1	—
S.	Granton	—	—	—	—	—	1	—	—
E.	Great Yarmouth	1	—	—	—	—	—	—	—
I.	Greenore	—	—	—	—	1	—	—	—
I.	Greencastle	—	—	1	—	—	—	—	—
E.	Garston Dock	1	—	—	—	—	—	—	—
I.	Galway	—	—	1‡	—	—	—	—	—
E.	Hartlepool	—	—	—	—	—	1	—	—
E.	Hayle (Lelant Quays)	—	—	—	—	—	—	1	—
E.	Hayle (Port)	1	—	—	—	—	—	—	—
S.	Helmsdale	—	—	—	—	—	—	1	—
E.	Holyhead	—	—	—	—	1	—	—	—
I.	Howth	—	1	—	—	—	—	—	—
E.	Hull Docks	—	—	—	—	1	—	—	—
E.	Hull (Old Harbour)	—	—	—	—	1	—	—	—
E.	Humber Conservancy	1	—	—	—	—	—	—	—
E.	Harwich	1	—	—	—	—	—	—	—
E.	Ilfracombe	1	—	—	—	—	—	—	—
I.	Inniscoo	—	—	—	—	—	—	1	—
E.	Ipswich	1	—	—	—	—	—	—	—
S.	Irvine	1	—	—	—	—	—	—	—
S.	Invergordon	1	—	—	—	—	—	—	—
S.	Inverness	—	—	1	—	—	—	—	—
I.	Jeelin	—	—	—	—	—	—	1	—
E.	Kidwelly	—	—	—	—	—	—	1	—
I.	Killough	—	—	—	—	1	—	—	—
I.	Kilkeel	1	—	—	—	—	—	—	—
	Carried forward	41	8	9	—	29	4	19	—

* Fraserburgh appeared in list of prohibited places in 1876.

† In this case there is one set of byelaws for gunpowder, and another set for other explosives.

‡ 50 lbs.

Initial Letter of Country in which Harbour is situated.	Place.	Under Explosives Act.						Where either (*a*) No Trade in Explosives exists; or (*b*) where such Traffic has been prohibited by Powers other than the Explosives Act.	
		Byelaws made regulating General Traffic		Byelaws made limiting Traffic to 30 lbs.		Byelaws made prohibiting Traffic			
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.
	Brought forward - -	41	8	9	—	29	4	19	—
S.	Kingsbarns - - - -	—	—	—	—	—	—	1	—
E.	King's Lynn - - -	1	—	—	—	—	—	—	—
S.	Kingston, N.B., *see* Garmouth -	—	—	—	—	1	—	—	—
I.	Kingstown - - - -	—	1	—	—	—	—	—	—
S.	Kirkcaldy - - - -	—	1	—	—	—	—	—	—
I.	Kircubbin - - - -	—	—	—	—	1	—	—	—
S.	Kirkcudbright - - -	—	—	—	—	1	—	—	—
S.	Kirkwall - - - -	1	—	—	—	—	—	—	—
I.	Killybegs - - - -	—	—	1	—	—	—	—	—
E.	Lancaster - - -	—	—	—	—	—	—	1	—
S.	Largo - - - -	—	—	—	—	1*	—	—	—
S.	Largs - - - -	—	—	—	—	—	—	1	—
I.	Larne - - - -	1	—	—	—	—	—	—	—
S.	Leith - - - -	1	—	—	—	—	—	—	—
S.	Leith (additional) - -	1	—	—	—	—	—	—	—
I.	Limerick - - -	—	1	—	—	—	—	—	—
S.	†Little Ferry - - -	—	—	1	—	—	—	1	—
E.	Littlehampton - - -	1	—	—	—	—	—	—	—
E.	Llanelly (including Burry Navigation).	1	—	—	—	—	—	—	—
I.	Londonderry - - -	—	1	—	—	—	—	—	—
E.	Looe - - - - -	—	—	—	—	—	—	1	—
S.	Lybster - - - -	—	—	1	—	—	—	—	—
E.	Lymington - - -	—	1	—	—	—	—	—	—
I.	Leabgarrow - - -	—	—	1	—	—	—	—	—
S.	Macduff - - - -	—	—	—	—	1	—	—	—
E.	Margate - - -	—	—	1	—	—	—	—	—
E.	Maryport - - -	—	—	—	—	1	—	—	—
E.	Menai Bridge Pier - -	—	—	—	—	—	—	1	—
S.	Methill - - - -	—	—	—	—	1	—	—	—
S.	Montrose - - - -	—	—	—	—	—	—	1	—
E.	Mousehole - - - -	—	—	—	—	—	—	1	—
I.	Mullaghmore - - -	—	—	—	—	—	—	1	—
S.	Morrisonshaven - - -	—	—	—	—	1	—	—	—
E.	Mersey Docks and Harbour Board.	1	—	—	—	—	—	—	—
E.	Minehead - - - -	1	—	—	—	—	—	—	—
I.	Moville - - - -	—	—	1	—	—	—	—	—
I.	Mountcharles - - -	—	—	1	—	—	—	—	—
E.	Neath - - - -	—	1	—	—	—	—	—	—
S.	Newbiggin - - -	—	—	—	—	—	—	1	—
S.	Newburgh Shore - -	—	—	—	—	—	—	1	—
I.	Newcastle (County Down) -	1	—	—	—	—	—	—	—
E.	Newhaven - - - -	—	—	1	—	—	—	—	—
S.	Newport (near Dundee) -	—	—	—	—	—	—	1	—
E.	Newport, Isle of Wight (*see* Cowes).	1	—	—	—	—	—	—	—
E.	New Quay (Cardigan) - -	—	—	—	—	—	—	1	—
E.	North Sunderland - -	—	—	—	—	—	—	1	—
E.	Orford - - - - -	—	—	—	—	—	—	1	—
S.	Pittenweem - - - -	—	—	—	—	1	—	—	—
E.	Poole - - - - -	1	—	—	—	—	—	—	—
I.	Portaferry - - - -	1	—	—	—	—	—	—	—
S.	Port Gordon - - -	—	—	—	—	1	—	—	—
E.	Porthleven - - - -	1	—	—	—	—	—	—	—
S.	Port Logan - - -	—	—	—	—	—	—	1	—
S.	Port McAdam (*see* Gatehouse) -	—	—	—	—	1	—	—	—
I.	Port Rush - - -	—	—	—	—	—	—	1	—
I.	Portsalon - - - -	—	—	1	—	—	—	—	—
E.	Portsmouth - - -	—	1	—	—	—	—	—	—
S.	Pulteney (Wick) - -	1	—	—	—	—	—	—	—
	Carried forward - -	57	16	19	—	40	4	37	—

* Largo appeared in list of prohibited places in 1876.
† Little Ferry appeared in list of prohibited places in 1876.

Initial Letter of Country in which Harbour is situated.	Place.	Under Explosives Act.						Where either (*a*) No Trade in Explosives exists; or (*b*) where such Traffic has been prohibited by Powers other than the Explosives Act.	
		Byelaws made regulating General Traffic		Byelaws made limiting Traffic to 30 lbs.		Byelaws made prohibiting Traffic			
		Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.
	Brought forward	57	16	19	—	40	4	37	—
S.	Pettycur	—	—	—	—	1	—	—	—
E.	Portmadoc	1	—	—	—	—	—	—	—
S.	Portmahomac	1	—	—	—	—	—	—	—
S.	Portsoy	—	—	—	—	1	—	—	—
I.	Portnablahey	—	—	1	—	—	—	—	—
S.	Peterhead	1	—	—	—	—	—	—	—
I.	Quoile	—	—	—	—	1	—	—	—
E.	Queenborough	1	—	—	—	—	—	—	—
E.	Ramsgate	—	—	1	—	—	—	—	—
I.	Red Bay	—	1	—	—	—	—	—	—
I.	Rogerstown	—	—	—	—	—	—	1	—
I.	Rosslare	—	—	—	—	—	—	1	—
E.	Runcorn	1	—	—	—	—	—	—	—
I.	Rush	—	—	—	—	—	—	1	—
E.	Rye	—	—	1	—	—	—	—	—
I.	Rathmullan	—	—	1	—	—	—	—	—
S.	Rosehearty	—	—	—	—	1	—	—	—
E.	Rochester	1	—	—	—	—	—	—	—
S.	Stornoway	1	—	—	—	—	—	—	—
S.	St. David's, Scotland	—	—	—	—	1	—	—	—
S.	Sanday Pier	1	—	—	—	—	—	—	—
S.	Sandhaven	—	—	—	—	1	—	—	—
E.	Scarborough	1	—	—	—	—	—	—	—
E.	Sharpness New Docks	1	—	—	—	—	—	—	—
E.	Shoreham (New)	1	—	—	—	—	—	—	—
E.	Silloth	—	—	—	—	1	—	—	—
I.	Sligo	1	—	—	—	—	—	—	—
S.	South Alloa	1	—	—	—	—	—	—	—
E.	Southampton	1	—	—	—	—	—	—	—
E.	Southwold	—	—	—	—	—	—	1	—
E.	Spalding	—	—	—	—	—	—	1	—
S.	Stairhaven	—	—	—	—	—	—	1	—
S.	Starlyburn	—	—	—	—	—	—	1	—
I.	Strangford	—	—	—	—	—	—	1	—
E.	Sunderland	—	—	—	—	—	1	—	—
E.	Sutton	—	1	—	—	—	—	—	—
E.	Swansea Harbour Trust	—	1	—	—	—	—	—	—
S.	Tayport	—	—	—	—	1	—	—	—
E.	Tees Conservancy	1	—	—	—	—	—	—	—
I.	Teelin Harbour	—	—	1	—	—	—	—	—
E.	Teignmouth	1	—	—	—	—	—	—	—
E.	Tetney Haven	—	—	—	—	—	—	1	—
E.	Thames	1	—	—	—	—	—	—	—
S.	Troon	—	—	—	—	—	1	—	—
E.	Truro	1	—	—	—	—	—	—	—
E.	Tyne, Port of	1	—	—	—	—	—	—	—
E.	Watchet	1	—	—	—	—	—	—	—
E.	Weston-super-Mare	—	—	—	—	—	—	1	—
I.	Westport	—	—	—	—	—	—	1	—
S.	West Wemyss	—	—	—	—	1	—	—	—
I.	Wexford	1	—	—	—	—	—	—	—
E.	Whitby	1	—	—	—	—	—	—	—
S.	Whitehills	—	—	—	—	1	—	—	—
E.	Wisbech	1	—	—	—	—	—	—	—
E.	Widnes Dock	—	—	—	—	1	—	—	—
S.	Woodhaven	—	—	—	—	—	—	1	—
E.	Workington	—	—	—	—	—	1	—	—
	Total	78	19	23	—	51	7	49	—

SUMMARY.

Country.	Byelaws Approved.							No. of Harbours the Authorities of which have either prohibited the Traffic of Explosives altogether under powers which they possess independently of the Explosives Act, 1875, or have represented that there is not and is not likely to be any Traffic in Explosives at their Harbours.		Total No. of Harbours provided for.
	Regulating Traffic in Explosives		Limiting Traffic to 30 lbs.		Prohibiting Traffic		Total.			
	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.	Previous to 1878.	During 1878.		Previous to 1878.	During 1878.	
ENGLAND -	48	7	5	—	14	4	78	16	—	94
SCOTLAND -	14	3	5	—	30	3	55	22	—	77
IRELAND -	16	9	13	—	7	—	45	11	—	56
TOTALS -	78	19	23	—	51	7	178	49	—	227

APPENDIX R.

DETAIL of APPLICATIONS for IMPORTATION LICENSES from 1st January to 31st December 1878.

Licences.	No. of Applications.		No. Rejected during present Year.	No. Withdrawn during present Year.	No. in Progress.		No. Granted.		Remarks.
	Old; viz., outstanding at beginning of 1878.	New; viz., during present Year.			Old; viz., outstanding at beginning of 1878.	New; viz. submitted during present Year.	Old; viz., outstanding at beginning of 1878.	New; viz., during present Year.	
Original -	—	12	3	—	—	—	—	9	
Renewals -	—	2	—	—	—	—	—	2	
Total -	—	14	3	—	—	—	—	11	

APPENDIX S.

TABLE of EXPLOSIVES (for which an Importation License is required) authorised to be IMPORTED, with the NUMBER of LICENSES GRANTED for each EXPLOSIVE.

Class and Name of Explosive.	Importation Licenses in force on 31st December 1877.		Importation Licenses Granted during 1878.		Importation Licenses still in force on 31st December 1878.	
	Index Nos. of Licenses.	Total.	Index Nos. of Licenses.	Total.	Index Nos. of Licenses.	Total.
Class 3. Division 1. Dynamite (Nos. 1 and 2) -	18.	1	—	—	—	—
„ 3. „ 1. Lithofracteur - -	19.	1	28.	1	19.* 28.	1 1
„ 3. „ 1. Blasting Gelatine (No. 1) -	—	—	29.	1	29.	1
„ 5. „ 1. Fulminate of Mercury -	2.	1	—	—	2.*	1
„ 6. „ 2. Cartridges for Cannon or Blasting made with Dynamite - -	18.	1	—	—	—	—
„ 6. „ 2. Do. do. with Blasting Gelatine	—	—	29.	1	29.	1
„ 6. „ 2. Do. do. with Lithofracteur -	19.	1	—	—	19.*	1
„ 6. „ 2. Instantaneous Fuze -	—	—	26.	1	26.	1
„ 6. „ 3. Bornhardt's Electro Detonator Fuze - -	—	—	27.	1	27.	1
„ 6. „ 3. Detonators - - -	14,15,17.	3	21,22,23, 24, 25.	5	21,22,23, 24, 25.	5
	2,14,15, 17,18,19.	6	21,22,23, 24,25,26, 27,28,29.	9	2, 19, 21, 22,23,24, 25,26,27, 28, 29.	11

* Renewed during 1878.

APPENDIX T.

Explosives.—Conviction Return.

Prosecutions from 1st January to 31st December 1878.

Date of Hearing.	Place of Hearing.	Name of Offender.	Act under which Proceedings were taken.	Number of Information.	Nature of Offence.	Result of Hearing.	Amount of Penalty.	Amount of Costs.	Amount of Forfeiture or Penalty in lieu.	Remarks.
1878.							£ s. d.	£ s. d.	£ s. d.	
16th Jan.	Nottingham	Messrs. John Hall and Son.	Explosives Act, 1875.	1	Storing gunpowder in an unauthorised place, viz., Messrs. Hall's No. 5 magazine at Eastwood.	Convicted	50 0 0	—	Forfeiture of 2,525 lbs. of gunpowder, and 1,175 lbs. of blasting cartridges. Total 3,700 lbs.	The forfeited gunpowder was afterwards restored by Secretary of State.
Do.	Do.	Mr. John Ault	Do.	1	Not having lightning conductor attached to magazine.	Do.	5 0 0	—	Forfeiture of 13,400lb. of gunpowder.	Do. do.
				2	Magazine not lined so as to prevent grit being mixed with the gunpowder.	Do.	5 0 0	—		
				3	Not making due provision, by suitable shoes or otherwise, to exclude iron, steel, and grit, contrary to Order in Council.	Do.	5 0 0	—		
				4	Not providing suitable over-clothing for persons employed.	Do.	5 0 0	—	—	
				5	Non-posting of notices required under sub-sec. 6, sec. 10, and sec. 77 of the Act (except the general rules.)	Do.	5 0 0	—	—	
22nd Jan.	Huddersfield	Foster Shaw	Do.	1	Excess in factory magazine for gunpowder	Do.	10 0 0	Amount of costs not stated.	2 0 0	
				2	Storing gunpowder in factory magazine not authorised for gunpowder.	Do.	10 0 0		2 0 0	
				3	Not keeping factory magazine for gunpowder free from grit.	Do.	2 0 0	Do.	—	
				4 and 5	Not providing lightning conductor for two factory magazines.	Do.	4 0 0	Do.	—	
Do.	Do.	Allan Jessop	Do.	1	Excess in factory magazine for gunpowder	Do.	10 0 0	Do.	2 0 0	
				2	Keeping fireworks in a store for non-explosive	Do.	5 0 0	Do.	2 0 0	
				3	Not keeping factory magazine for gunpowder free from grit.	Do.	5 0 0	Do.	—	
				4	Not providing lightning conductor for factory magazine.	Do.	2 0 0	Do.	—	
				5 to 8	Not keeping four danger buildings free from grit.	Do.	8 0 0	Do.	—	
Do.	Do.	George Newsome	Do.	1	Keeping gunpowder in an unauthorised place	Do.	5 0 0	Do.	1 0 0	
					Carried forward		136 0 0		9 0 0	

PROSECUTIONS from 1st January to 31st December 1878—*continued.*

Date of Hearing.	Place of Hearing.	Name of Offender.	Act under which Proceedings were taken.	Number of Information.	Nature of Offence.	Result of Hearing.	Amount of Penalty.	Amount of Costs.	Amount of Forfeiture or Penalty in lieu.	Remarks.
							£ s. d.	£ s. d.	£ s. d.	
1878.					Brought forward - -	- - -	136 0 0	—	9 0 0	
				2	Manufacturing fireworks in an unauthorised place.	Convicted -	5 0 0	Amount of costs not stated.	—	
16th April -	Northwich, P. S. Division of Leftwich.	Messrs. Verdin and Sons.	Explosives Act, 1875.	1	For having an excess of 600 lbs. weight of gunpowder in their store at Marston.	Do. -	2 0 0	—	—	The amount of gunpowder was reduced within the proper quantity, and the justices did not direct its forfeiture. Proceedings instituted by local authority at instance of Government inspector, by whom explosives had been found and seized.
22nd April -	Tralee, co. Kerry	Mr. McCowan -	Do. -	1	For having an excessive quantity of powder to the amount of 69 lbs. beyond the quantity permitted by the Act.	Do. -	3 9 0	—	—	Fined 1*s.* for each lb. of powder in excess. No order made to forfeit the powder. The proceedings were instituted by the local authority, the seizure having been effected by a Government inspector.
27th June -	County Police Court, Ulverston.	Barrow Hæmatite Steel Co., Dalton-in-Furness.	Do. -	1	Not having a lightning conductor as required by sec. 17, § 5.	Do. -	2 0 0	0 11 0	—	Prosecuted by officers of local authority, at instance of Major Majendie, by whom seizure of powder was made.
				2	Not being so constructed or lined, &c. as to satisfy requirements of sec. 17, § 4.	Do. -	2 0 0	0 11 0	—	
				3	Due provision not being made by the use of magazine boots, &c., sec. 17, § 8.	Do. -	2 0 0	0 11 0	—	
				4	Due provision not being made by the use of clothing without pockets, sec. 17, § 8.	Do. -	2 0 0	0 11 0	—	
				5	Store not kept as far as reasonably practicable free from grit, sec. 17, § 4.	Do. -	2 0 0	0 11 0	—	
				6	Tools and implements used not conforming to requirements of sec. 17, § 7.	Do. -	2 0 0	0 11 0	—	
				7	Using store for other purposes than the keeping of gunpowder, &c., sec. 17, § 3.	Do. -	2 0 0	0 11 0	—	
12th July -	Barmouth - -	Thomas Roberts -	Do. -	1	Storing gunpowder in an unauthorised place -	Do. -	5 13 0¼	Amount not stated.	—	
24th July -	Ambleside Petty Sessions.	Elterwater Gunpowder Company, Limited.	Do. -	1	Having corning-house not so lined or covered as to prevent detachment of grit (contrary to sec. 10, § 2).	Do. -	2 0 0	0 10 2	—	
				2	Do. as to press-house - - - -	Do. -	2 0 0	0 10 2	—	
					Carried forward - - -	- - -	170 2 0½	4 17 4	9 0 0	

Date of Hearing.	Place of Hearing.	Name of Offender.	Act under which Proceedings were taken.	Number of Information.	Nature of Offence.	Result of Hearing.	Amount of Penalty.	Amount of Costs.	Amount of Forfeiture or Penalty in lieu.	Remarks.
							£ s. d.	£ s. d.	£ s. d.	
1878.					Brought forward - - -	- - -	170 2 0¼	4 17 4	9 0 0	
				3	Do. as to glazing house (and presence of exposed iron in same).	Convicted -	2 0 0	0 10 2	5 0 0	
				4	Do. as to charge house (and presence of exposed iron).	Do. -	2 0 0	0 10 2	—	
				5	Do. as to mixing house - - - -	Do. -	0 5 0	0 10 2	—	
				6	Do. as to expense magazine - - -	Do. -	2 0 0	0 10 2	—	
				7	Not keeping the packing and dusting house reasonably clean and free from grit (contrary to sect. 10, § 2.)	Do. -	5 0 0	0 10 2	5 0 0	
				8	Do. as to store - - - - -	Do. -	2 0 0	0 10 2	—	
				9	Do. as to press-house - - -	Do. -	2 0 0	0 10 2	—	
				10	Not making due provision, by the use of suitable shoes or otherwise, to exclude grit from a danger building (contrary to sec. 10, § 8).	Do. -	2 0 0	0 10 2	—	
				11	Not making due provision, by the use of suitable clothes without pockets, searching or otherwise (contrary to sec. 10, § 8).	Do. -	10 0 0	0 10 2	—	
				12	Not posting up special rules in danger building (sec. 10, § 1).	Do. -	0 5 0	0 10 2	—	
6th August -	Wrexham -	The Westminster Brymbo Coal and Coke Co., Limited.	Explosives Act, 1875.	1	Breach of Order in Council No. 5 in using a store not qualified by reason of its being too near protected works.	Do. -	10 0 0	0 8 6	—	
				2	Not keeping the same free from grit and clean	Do. -	5 0 0	0 10 6	—	
				3	Not making due provision for preventing the introduction of matches, &c. thereinto.	Do. -	5 0 0	0 8 6	—	
				4	Using a workshop in connection therewith not constructed so as to prevent the detachment of grit, &c.	Do. -	5 0 0	0 9 6	—	
				5	Using a workshop not in the immediate neighbourhood of the store.	Do. -	5 0 0	0 8 6	—	
10th August -	The gaol, Little Ilford (Ilford P. S. D).	Wm. Bantock	Do. - - -	1	Making impure wood gunpowder, contrary to the terms of his license.	Do. -	10 10 0	7 18 6	—	
23rd August -	The Precincts, Rochester.	John Macdonald -	Do. -	1	Neglecting to post copy of prescribed general rules (contrary to general rule of Order in Council No. 2).	Do. - -	10 0 0	—	Forfeiture of 436 rockets of different sizes, and 400 lbs. of rocket composition.	
				2	Absence of due provision, by use of suitable shoes or otherwise, to exclude grit from factory magazine (contrary to 8th general rule of Order in Council No. 2).	Do. - -	1 0 0	—		
				3	Not removing oiled waste from a danger building (contrary to 4th general rule of Order in Council No. 2).	Do. - -	1 0 0	—		
					Carried forward - - -	- - -	250 2 0¼	20 3 0	19 0 0	

PROSECUTIONS from 1st January to 31st December 1878—*continued.*

Date of Hearing.	Place of Hearing.	Name of Offender.	Act under which Proceedings were taken.	Number of Information.	Nature of Offence.	Result of Hearing.	Amount of Penalty. £ s. d.	Amount of Costs. £ s. d.	Amount of Forfeiture or Penalty in lieu. £ s. d.	Remarks.
1878.					Brought forward - - -	- - -	250 2 0¼	20 3 0	19 0 0	
				4	Keeping unauthorised articles in factory magazine (contrary to 1st general rule of Order in Council No. 2).	Convicted -	1 0 0	—	—	
				5	Not keeping interior of magazine clean (contrary to general rule 2 of Order in Council No. 2).	Do. -	1 0 0	—	—	
				6	Breach of terms of license (contrary to sec. 9).	Do. -	1 0 0	—	—	
6th Sept. -	County Police Office, Ormskirk.	Tawd Vale Colliery Co., Limited.	Explosives Act, 1875.	1	Gunpowder store within the distance assigned from a protected work of class 1, viz., a mineral railway.					
				2	Unprovided with a lightning conductor - -					
				3	It is not so lined or covered internally as to prevent the detachment of grit, &c., being of bare brick unlined.					
				4	No provision made, by the use of suitable shoes or otherwise, to satisfy the requirements of the Act as to exclusion of grit and exposed iron or steel.	Do. -	5 0 0	2 10 0	—	The proceedings were instituted by local authority, at instance of Major Ford, by whom the seizure of powder was made.
				5	The interior of the store is not kept, so far as is reasonably practicable, free from grit and otherwise clean.					
				6	Due provision not made, by the use of suitable working clothes without pockets, searching or otherwise, to prevent the introduction of matches, &c.					
Do. -	Police Office, Ormskirk.	White Moss Colliery Co., Limited.	Do. -	1	Keeping explosive (1,325 lbs. of gunpowder) in an unauthorised place.	Do. -	10 0 0	2 10 0	The forfeiture was not inflicted.	Proceedings instituted by local authority at instance of Major Ford, by whom seizure of powder was made.
10th Dec.	Caerphilly, Glamorganshire (P. S. D. of Caerphilly Lower).	Messrs. Cross, Bros., Cardiff.	Do. -	1	Storing articles other than gunpowder, viz., straw and grain (sec. 10, § 1).					
				2	Storing explosives other than gunpowder, viz., cartridges for small arms.					
				3	Absence of lining to interior of magazine (sec. 10, § 2).					
				4	Absence of lightning conductor (sec. 10, §. 3).	Do. -	5 0 0	4 16 0	—	
				5	Not keeping magazine free from grit and clean (sec. 10, § 2).					
				6	Absence of proper provision as to magazine boots (sec. 10, § 8).					
				7	Due precautions not taken to prevent accidents, and to prevent unauthorised persons having access to explosives.					
					Total - - - - - -	- - -	273 2 0¼	29 19 0	19 0 0	
							Total 322 1 0¼			

APPENDIX U.

DETAIL RETURN of INSPECTIONS and other VISITS from 1st January to 31st December 1878.

—	Factories.	Magazines.	Stores.	Small Firework Factories.	Registered Premises.	Places not classed.	Sites.	Inquests.	Inquiries and Investigations.	Local Authorities.	Miscellaneous.	Total.
In 1878 -	80	142	210	8	38	46	10	8	7	99	152	800
In 1877 -	*57*	*215*	*215*	*9*	*17*	*117*	*7*	*8*	*6*	*241*	*101*	*993*
In 1876 -	*40*	*72*	*39*	*4*	*11*	*88*	*15*	*14*	*8*	*88*	*78*	*457*

APPENDIX V.

LIST of COUNTIES visited for the purpose of INSPECTION, &c. during the year 1878.

ENGLAND AND WALES.			SCOTLAND.	IRELAND.
Anglesey.	Dorset.	Montgomery.	Argyll.	Antrim.
Brecon.	Essex.	Nottingham.	Ayr.	Armagh.
Berks.	Flint.	Pembroke.	Edinburgh.	Cork.
Cambridge.	Glamorgan.	Salop.	Fife.	Down.
Cardigan.	Gloucester.	Somerset.	Inverness.	Dublin.
Carmarthen.	Hants.	Stafford.	Lanark.	Galway.
Carnarvon.	Hereford.	Surrey.	Linlithgow.	Kerry.
Chester.	Kent.	Sussex.	Perth.	Kilkenny.
Cornwall.	Lancaster.	Warwick.	Stirling.	Limerick.
Cumberland.	Lincoln.	Westmoreland.		Louth.
Denbigh.	Merioneth.	Worcester.	Total, 9.	Waterford.
Derby.	Middlesex.	York.		Wicklow.
Devon.	Monmouth.	Total, 38.		Total, 12.
		Grand Total, 59.		

APPENDIX V1.

VISITS to BOROUGH LOCAL AUTHORITIES since the ACT came into operation.

ENGLAND AND WALES.		SCOTLAND.	IRELAND.
Aberystwith.	London.	Aberdeen.	Belfast.
Abingdon.	London Metropolitan Board of Works.	Ayr.	Carrickfergus.
Bedford.	Leamington.	Arbroath.	Cork.
Bristol.	Maidstone.	Airdrie.	Dublin.
Bath.	Manchester.	Banff.	Drogheda.
Brighton.	Newport.	Cupar.	Galway.
Birmingham.	Newbury.	Dunfermline.	Kilkenny.
Carlisle.	Norwich.	Dundee.	Limerick.
Chesterfield.	Newcastle-upon-Tyne.	Dornoch.	Londonderry.
Chester.	Oxford.	Elgin.	Newry.
Cambridge.	Penzance.	Edinburgh.	Queenstown.
Canterbury.	Plymouth.	Forres.	Waterford.
Derby.	Reading.	Forfar.	Total, 12.
Dover.	Rochester.	Glasgow.	
Dudley.	Southampton.	Greenock.	
Exeter.	Salford.	Haddington.	
Falmouth.	Stafford.	Hamilton.	
Flint.	Swansea.	Irvine.	
Folkestone.	Shrewsbury.	Inverary.	
Faversham.	St. Ives.	Inverness.	
Gateshead.	Truro.	Kilmarnock.	
Guildford.	Windsor.	Kirkcaldy.	
Gravesend.	Wigan.	Linlithgow.	
Hertford.	Walsall.	Montrose.	
Helston.	Winchester.	Nairn.	
Hartlepool.	Wolverhampton.	Portobello.	
Hanley.	Worcester.	Perth.	
Huddersfield.	Warwick.	Paisley.	
Ipswich.		Rutherglen.	
Kidderminster.		Stirling.	
Liverpool.	Total, 59.	Tain.	
		Total, 31.	

SUMMARY.

England and Wales	59
Scotland -	31
Ireland -	12
Grand Total	102

APPENDIX W.

ACCIDENTS by FIRE or EXPLOSION which have come under the notice of Home Office, from 1st January to 31st December 1878.

Index No.	Date of Accident.	Nature of Explosive.	Where Accident occurred.	Cause of Accident so far as ascertained.	No. of Persons	
					Killed.	Injured.
	1878.					
1	10 Jan.	Firework composition.	Mr. Hammond's Firework Factory, Powder Hall Grounds, Edinboro'.	Accident occurred in the operation of breaking or mixing up the compound (which had got into hard lumps) in a marmalade pot with a copper rocket spike.	—	1
2	17 Jan.	"Tonite" or cotton powder.	West Basset Mine -	Two men had fired a charge of tonite in a hole, and then proceeded to bore the hole deeper; while so doing an explosion took place.	—	1
3	25 Jan.	Gunpowder -	Ormskirk, Clayton Street, Skelmersdale (Mr. Jackson's shop).	"A boy (Robert Jackson), about 9 years of age, went into the shop for the purpose of obtaining a candle, and whilst in the act of lighting it he threw the lighted wick of the candle, as he thought, on to the floor, but it unfortunately fell into a keg partially filled with blasting powder."	1	2
4	18 Jan.	Ditto -	Ashton-in-Makerfield -	"A woman was lighting the fire, as she thought, with paraffin, but it proved to be her husband's powder can."	—	1
5	24 Jan.	Dynamite -	Slate Quarry near Llanberis	A quarryman placed a quantity of dynamite on a stove with a view to "tempering" it.	2	—
6	29 Jan.	Gunpowder -	No. 8 incorporating mill, Tunbridge Factory, belonging to Messrs. Curtis and Harvey.	60 lbs. charge. Cause of accident unknown.	—	—
7	30 Jan.	"Tonite" or cotton powder.	West Basset Mine -	"Some men who were blasting, fired four holes and heard four reports; on going back to work they found that one hole had not done any execution, and proceeded to bore out the tamping."	—	1
8	2 Feb.	Gunpowder -	No. 7 incorporating mill, New Sedgwick Gunpowder Factory, Milnthorpe.	On a newly worked charge of 60 lbs., which had not recently been liquored, caused by breaking of a bolt in mill screen frame and falling into the charge during working. No one injured. Explosion did not communicate to other mills.	—	—
9	9 Feb.	Ditto -	No. 16 incorporating mill, Mr. Samuel Sharp, Chilworth, Guildford.	The charge (50 lbs. "merchants") had been worked nearly 2 hours. It had not been liquored for about $1\frac{3}{4}$ hours. The probable cause of the explosion is the breakage of a washer on the runner spindle, which was subsequently found in the mill.	—	—

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	1878.					
10	4 Feb.	Dynamite - -	Wheal Uny Mine, Cornwall.	Accident believed to have been caused either by miner (improperly) boring into an old hole, or accidentally striking some dynamite which had remained in neighbourhood of the hole.	—	1
11	12 Feb.	Detonators -	Cotton Powder Company's Factory, Uplees Marshes, Faversham.	Occurred in pressing detonators. (*Special Inquiry and Report.*)	—	2
12	6 Feb.	Dynamite -	Festiniog "No. 2 shaft," Tunnel in course of construction by London and North-western Railway Company.	The men were dressing the face with picks, and it is thought that the pick must have struck some nitro-glycerine which had exuded from the dynamite.	—	4
13	23 Jan.	Ditto -	Dinorwic Quarries, Llanberis.	Warming three primers of dynamite on a stove.	—	1
14	1 Feb.	Gunpowder -	Do. - -	Some spilt gunpowder deliberately set fire to by John Owen; this in turn set fire to a ¼ cask (about half full) of gunpowder.	—	2
15	8 Mar.	Dynamite -	Maenofferen Slate Quarry, Four Crosses, Festiniog.	Occurred through drilling out a hole which contained a charge of dynamite. The hole was drilled about 2 ft. deep; at the bottom was put a ball of dynamite, and on the top of the dynamite some black powder; the powder exploded without firing the dynamite.	—	1
16	11 Mar.	Gunpowder -	Middle Quarry, Oakley Quarry, Festiniog.	Some sparks from a light dropped on to a ledge (a space about 2 or 3 ft. wide), and ignited a train of gunpowder, which was afterwards found to have fallen from a cask or keg which was being carried along the same ledge previously.	—	1
17	29 Mar.	Ditto -	Two incorporating mills, Messrs. Hall and Sons Factory at Marsh Works.	The "green" charge had been working for about 2 hours. No cause can be assigned for the explosion.	—	—
18	30 Mar.	Dynamite -	Wheal Agar, near Redruth	Two men working in an "end" bored two holes, charged them with dynamite and ignited the fuze; only one hole exploded, and on the deceased returning to put in a fresh cap and detonator the hole which had missed fire went off, inflicting fatal injuries on the deceased.	1	—
19	5 April	Gunpowder -	Messrs. Curtis and Harvey's Factory at Tunbridge. No. 5 and 6 incorporating mills.	Weight of charge was 60 lbs. No cause can be assigned for the explosion.	—	—
20	18 April	Detonators -	Nobel's Explosives Company's West Quarter Factory. Detonator pressing machine.	Explosion in pressing machine followed by an explosion of some detonators which were knocked down by the workpeople as they effected their escape from the building.	—	—

Index No.	Date of Accident.	Nature of Explosive.	Where Accident occurred.	Cause of Accident so far as ascertained.	No. of Persons	
					Killed.	Injured.
	1878.					
21	10 April	Guncotton -	Halkyn Deep Level Mines	The jury found that the deceased died accidentally through suffocation by the fumes of guncotton, and recommended that in future more than five minutes should be allowed before going up to the "face" after firing charges of guncotton. (*Inquiry and Special Report.*)	1	11
22	2 May	Gunpowder -	Kames Gunpowder Company's Factory, No. 2 incorporating mill.	The charge (60 lbs.) had been working but a very short time, and the explosion caused very little damage. Cause unknown.	—	—
23	4 May	Experimental signals for use at sea.	Balham, Surrey -	A kind of ball charged with composition (a sort of fulminate), and fitted with a percussion cap, was employed. It appears that the cap failing to ignite the signal, a lighted match was applied, when it exploded with great violence.	—	2
24	10 May	Gunpowder -	Mr. Samuel Sharp's Factory, Chilworth, incorporating mill No. 5.	The mill (worked by steam power) was working on a 55 lbs. "green" charge. The explosion took place immediately on starting the mills on fresh charges. Nothing broken or displaced; cause of explosion unknown.	—	—
25	17 May	Detonators -	Nobel's Explosives Company's Factory, West Quarter, Stirling.	Caused by a barrow conveying the detonators from the magazine to the working shed being upset off the wooden platform by the skylarking and misconduct of two girls, who were both killed.	2	—
26	5 June	Ditto -	West Bromwich - -	The accident was ascribed (in the newspapers) to dynamite, but on inquiry it turned out that it was caused by the explosion of one or more detonators, with which the two injured children were playing.	—	2
27	June	"Tonite," *i.e.* cotton powder.	Cooke and Ddol Quarry Llanberis.	Deceased had bored a hole, and was about charging it with tonite, but, finding that the bore of the hole was small, he tried to force the tonite into it by hitting it with a stone. The accident was clearly the result of the neglect of a most elementary precaution, and one which a companion of the deceased knew so well to be necessary to safety, that he warned deceased against what he was doing.	1	—
28	17 June	Cap composition	Messrs. Eley Brothers' Factory at Edmonton.	A cap charger fired the powder in the act of charging her plate.	—	1

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	1878.					
29	24 June	"Tonite" -	Redruth, near Pednandrea Mine.	"On Monday evening, during celebration of midsummer night, several youngsters possessed themselves of some charges of tonite, and proceeded to fire them off on a piece of wastel near Pednandrea Mine. One of the lads (Samuel Jackson, aged 16 years) sustained serious injury by the charge going off in his hand."	—	1
30	14 May	Dynamite -	Yarlside Mines, near Barrow-in-Furness.	Several bore holes which had been loaded were fired at the same time; one missed fire, and on another set of men going to work, and proceeding to remove the loosened ore, an explosion occurred. (*Special Inquiry and Report.*)	1	—
31	29 June	Gunpowder -	The New Sedgwick Gunpowder Company's Factory, Westmoreland, incorporating mills, Nos. 1, 2, 3, 4, 5, and 6.	Working on "green charges" of 60 lbs. The charges had been recently liquored, and the probable cause of explosion assigned was the very hot weather and an east wind.	—	—
32	20 June	Dynamite -	West Seton Mine, Camborne.	"A young woman whilst 'spalling' (*i.e.* breaking stones with a hammer) struck a stone with a hole in it, and immediately there was a loud explosion, pieces of the stone flying in all directions, some striking her in the face. It is supposed some dynamite was left in the hole in the stone, and that the blow exploded it. It is possible that the explosion was due to an unexploded detonator remaining in the débris."	—	1
33	22 June	Gunpowder -	The Gorsedd and Merllyn Consols Mine, Holywell.	The accident occurred in the act of ramming in the charge with a copper rammer, driven by a hammer. It seems probable that the explosion was due to the heat generated by the friction which arose in the course of the forcible driving down of the charge into the blast hole.	—	2
34	29 June	Detonators -	Parish of Kilnaughton, Larne, county Antrim.	A woman, named Martha Carmichael, pricked a detonator with a needle, when it exploded, exploding two other detonators which were in her lap,	—	1

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					Killed.	Injured.
	1878.					
35	4 July	Dynamite -	Yarlside Mines, Barrow-in-Furness.	The deceased was a miner in the employ of the Yarlside Mining Company, and when in the act of boring with a machine into the rock, the machine is believed to have come in contact with some exuded nitro-glycerine. (*Special Inquiry and Report.*)	1	1
36	1 July	Gunpowder -	Camborne, Condurrow -	Some boys playing with gunpowder set fire to their clothes.	1	1
37	6 July	Ditto -	Henry Pit, near Whitehaven.	Collier killed in drawing a pricker from a charge which had been stemmed.	1	—
38	22 June	Detonator -	West Blue House - -	Several pitmen were in the Blue House public-house on the evening of 22nd June 1878, when one of them, named Laverick, produced a detonator, and said he would bet any man in the room a glass of ale that they could not pick a "white thing off "the end with a pin." A pitman named Brain picked it with a pin; the detonator exploded, shattering the fingers of his hands very much.	—	1
39	2 July	Dynamite -	Stainton, near Dalton	The fuze had failed to ignite the detonator, and the men pulled it out. Probably some smouldering particle set fire to the primer, and caused the rest of the charge to explode.	—	1
40	3 May	Guncotton -	Park Slate Quarry, near Penrhyndeudraeth.	The explosion was caused by drawing a charge from a blast hole. (This accident was not reported at proper time to Explosives Department.)	—	1
41	20 July	Gunpowder -	Incorporating mill, No. 15, Messrs. Pigou, Wilks, and Laurence (Limited), Factory, Dartford.	The mill exploded on a "green" charge; cause not known. Drenching apparatus acted well, and saved the adjoining mill, No. 16.	—	—
42	23 July	Dynamite -	Esgeirgelliog, Montgomery	It is supposed that Morris (the injured man) met his accident whilst using dynamite for the purpose of destroying salmon, and that he held the dynamite cartridge too long in his hand after he had lighted the fuze.	—	1
43	23 July	Gunpowder -	Dolcoath Mine, Cornwall -	The explosion took place while deceased was ramming down the second layer of tamping with an iron bar.	1	—
44	5 Aug.	Dynamite -	Moor Row Company's Mine, Moor Row, near Whitehaven.	The deceased was killed by an explosion of dynamite while charging a hole.	1	—
45	6 Aug.	Gunpowder -	Store belonging to Messrs. John Haigh and Sons, Victoria Colliery, Bruntcliffe.	The store was destroyed by lightning. (*Special Inquiry and Report.*)	—	2

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					Killed.	Injured.
	1878.					
46	7 Aug.	Gunpowder -	Assheton Mine, Carnarvonshire.	The accident was caused by unramming with an ordinary steel borer of a charge of powder which had missed fire.	—	1
47	8 Aug.	Detonators -	Nobel's Explosives Company, West Quarter Factory, Stirling.	The accident appears to have been caused by the improper use by the injured girl, of an implement not authorised for the purpose, for pressing the detonators.	—	1
48	10 Aug.	Gunpowder -	Two incorporating mills at Messrs. Williamson & Co., Fernilee Gunpowder Works.	The explosion was caused by the blow from the hammer, probably falling on the iron lining of the runner while the mill was undergoing repair. The jury returned a verdict of "Accidental death," and suggested that iron runners be substituted for the stones in use at the time of the explosion.	1	2
49	9 Aug.	Fireworks -	Mrs. Bibby's Small Firework Factory, No. 7.	One of the workwomen, whilst engaged in "lapping and dotting" some small wheels, upset a lamp, which set fire to the wheels, of which about 1½ gross were destroyed.	—	—
50	19 Aug.	Gunpowder -	Mr. Samuel Sharp's Gunpowder Factory, Chilworth. Incorporating mill.	The accident is attributed to the breaking of the flange of a brass bush in one runner.	—	—
51	23 Aug.	Ditto -	Wheal Sisters Mine, Lelant, Cornwall.	The miners had bored a hole in slope of ground; charged it with ordinary gunpowder, which missed fire; they then, contrary to the Metalliferous Mines Act, took an ordinary borer or drill, bored out the tamping, and drove the drill or borer into the charge of gunpowder, which instantly exploded.	—	1
52	30 Aug.	Ditto -	Messrs. Curtis and Harvey's Factory at Hounslow. Incorporating mill No. 24.	Working on a charge of 50 lbs., which had been worked *two hours*, and liquored half an hour previous to the explosion.	—	—
53	13 Sept.	War rocket -	Mr. Macdonald's War Rocket Factory at Whitehill, Gravesend.	Supposed to be due to the establishment of undue friction, from the clogging of the composition between the drift and case; favoured, possibly, by the pressure of some hard foreign or gritty matter. (*Special Inquiry and Report.*)	—	2
54	20 Sept.	Gunpowder	Messrs. Hall and Sons Factory at Faversham, No. 39. Incorporating mill No. 126 on plan.	It is believed that the explosion was caused by the mill having been over "liquored." The charge which exploded was a "green" charge, weighing 60 lbs. Damage done, very trifling. Glass in windows of mill not broken.	—	—
55	24 Sept.	Ditto -	Elterwater Factory. Incorporating mill.	Cause not ascertained.	—	—

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	1878.					
56	19 Sept.	Gunpowder -	Oakeley Middle Quarries, Festiniog.	Wm. Ellis was going up a chamber by means of a chain, having at the time two cartridges hanging to his mouth ; one of them burst. The flame of the candle which he had in his hand caught the falling powder. Both cartridges went off. He was burnt, but not much.	—	1
57	26 Sept.	Ditto -	Messrs. Dickson and Co.'s Blackbeck Factory. Incorporating mills Nos. 4 and 5.	The millman was engaged in shutting the door of No. 4, after starting it from the outside, and the door of No. 5 was open at the time. He was slightly burnt on the nose and hands.	—	1
58	26 Sept.	Dynamite -	Festiniog Tunnel Works -	The accident occurred in the act of breaking up a large block of bastard slate which contained an unfired charge in one of the holes bored in it. It was too heavy to put into a waggon, and the two men were endeavouring to split it up with a wedge and hammer.	1	4
59	27 Sept.	Ditto -	Carn Brea Mine - -	The accident was caused by the drill operating immediately over some portion of the charge which had been left unexploded in the old hole, No. 1. (*Special Inquiry and Report.*)	2	3
60	Sept.	Gunpowder -	Brookside Pits - -	The deceased was killed by an explosion of a shot whilst at work at the Brookside Pits.	1	—
61	27 Sept.	Ditto -	Mount Batten, near Plymouth.	A quarryman killed by the premature explosion of a charge of gunpowder.	1	—
62	14 Oct.	Ditto -	Roanhead Mines, Dalton-in-Furness.	"The men had fired a hole on Friday previous, with dynamite, but it did not throw its burden, so they charged it subsequently with gunpowder, and while putting down the first lot of stemming, it exploded and seriously injured them."	—	2
63	14 Oct.	Cap composition	Messrs. R. and F. Joyce's Ammunition Factory, Waltham.	The coroner's jury found, that the deceased was accidentally killed by an explosion in a certain building known as his mixing house, where he was employed ; but how or from what cause such explosion arose, there is no evidence to show.	1	—
64	15 Oct.	Gunpowder	Messrs. Dickson and Co., Blackbeck Gunpowder Works. Factory 40. Five incorporating mills, 3 to 7.	The explosion occurred when the man was in the act of starting the mill upon a green charge, and was supposed to have been due to the charge not having been spread under the runners with sufficient care.	—	1

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					Killed.	Injured.
6	1878. 17 Oct.	Gunpowder -	Nitshill, near Glasgow, in the house of Alexander Carroll.	It appears to have been the practice of Carroll to extract powder from unfired small-arm cartridges in his house, and it is probable the accident occurred from some of the powder so extracted becoming ignited.	2	1
66	2 Aug.*	Ditto -	Dympath Quarry, Llanelly, Carmarthen.	The deceased was blasting the rock with powder, and when in the act of setting fire to the fuze with a match, the charge exploded, blowing off a portion of his head, and his body was thrown to a distance of about 10 yards.	1	—
67	15 Oct.	Ditto -	Oakeley Upper Slate Mines, Rhiwbryfdir, Festiniog.	It appears that a portion of the charge had not fired at the proper time, and that the miner went to work upon the loose stones with a crowbar, and fired the powder while so doing.	1	—
68	20 Oct.	Ditto -	Carn Brea Mines - -	"The explosion probably occurred from the miner over-ramming the hole charged with powder."	—	2
69	14 Oct.	Ditto -	Quarry at Crumner, near Oxford.	The accident was caused by the explosion of a charge of gunpowder while one of the deceased was in the act of ramming it down with an iron rod, and using stone grit for tamping. One man lingered for some time and died.	2	—
70	6 Nov.	Fireworks -	Samuel Jacobs, registered premises, Newport, Monmouth.	The accident was caused by a cracker being fired off in the shop, and igniting the stock of fireworks. The Explosives Act appears to have been violated in more than one particular.	—	1
71	2 Nov.	Ditto -	Townley, St. Tonge, Middleton, shop of Mr. Gilbert Gill.	Gill (a retailer of small fireworks) struck a match to light the gas in his shop, and then threw the match away among some fireworks exposed for sale, which ignited. The accident appears to have resulted from a non-observance of the provisions of the Act.	—	—
72	30 Oct.	Gunpowder -	Peaslake, Surrey, cottage of a man named Sherlock.	Some children playing with touch-paper set light to about 1 lb. of gunpowder in a tin canister.	—	2
73	7 Nov.	Ditto -	Deal and Dover Railway -	"A man named George Thomas was seriously injured on the Deal and Dover Railway by the accidental firing of a blasting charge."	—	1
74	14 Nov.	Detonator -	Nobel's Explosives Company's Factory (18), Stirling.	The accident occurred in the act of pressing a detonator in the pressing machine.	—	1

* Not reported at the time.

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					Killed.	Injured.
	1878.					
75	15 Oct.	Small-arm cartridge.	Messrs. Hart and White, gunmakers, 118, High Street, Colchester.	Caused by the gunmaker's assistant striking the base of a central-fire cartridge case with the box-wood handle of a corkscrew. About ¼ lb. of gunpowder was ignited by the explosion of the cartridge.	—	1
76	5 Nov.	Dynamite -	St. Agnes, Cornwall -	During the celebration of Gunpowder Plot on 5th November, some dynamite exploded and smashed about 20 panes of glass.	—	—
77	21 Nov.	Gunpowder -	Red Hill Cutting, on the new branch railway at Stourbridge.	"A shot having failed to explode, the two men (Smith and Wilkes) commenced taking out the charge. The fuze, however, had only hung fire, and the powder igniting, an explosion ensued."	—	2
78	27 Nov.	Cap composition	Messrs. Eley Brothers' Factory No. 6, Edmonton.	Cap charger fired the powder in her charging plate. The cause was attributed to a cap that had got out of its place on the top of another.	—	—
79	29 Nov.	Gunpowder -	Elterwater Gunpowder Factory. Corning-house.	Cause not ascertained. (*Special Inquiry and Report.*)	3	1
80	22 Nov.	Dynamite -	Carn Brea Mine - -	Explosion caused by striking a piece of iron (which was inserted in an old hole) on the head with a hammer. The hole, no doubt, contained some unexploded dynamite.	—	2
81	30 Nov.	Detonators -	Cotton Powder for Factory, Kent.	Explosion occurred in pressing machine; cause not ascertained. 100 detonators, containing about 2 oz. of fulminate, exploded. Damage confined to injury of machine and breakage of windows. Workpeople protected by screens.	—	—
82	4 Dec.	Dynamite -	Railway in course of formation between Oban and Dalmally, at a place named Letterwood.	The deceased, in order to soften the dynamite quicker, procured an old tin beef can, placed it in a pot partly filled with water, and suspended the pot from a tree over a small wood fire. About six or seven cartridges were placed in the tin; they left the pot for a short time; they then returned (nobody but themselves being present), when an explosion took place by which they were instantaneously killed.	2	—
83	6 Dec.	"Tonite," *i.e.*, cotton powder.	Cotton Powder for Factory, Uplees Marshes, Faversham.	Accident occurred in the process of forming cartridges of tonite by pressure in a machine for the purpose.	—	1

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	1878.					
84	7 Dec.	Gunpowder -	Oakely Middle Quarries, Rhiwbryfdir.	The man injured was engaged in preparing for a second blast, when the gunpowder became ignited, it is supposed either from a spark from a candle, or from the powder being applied to the hole too soon after the first blast.	—	1
85	9 Dec.	Cap composition	Messrs. Eley Brothers' Factory at Tanner's End.	Cap charger fired the powder in her charging plate without doing any harm.	—	—
86	10 Dec.	Gunpowder -	Craigton Quarry, parish of Logie, Clackmannan.	The deceased had broken his (iron) "needle," with which he was preparing a "shot." It is uncertain whether the accident arose in the course of removing the broken needle (at which, about an hour before the explosion, he was heard to be hammering), or whether it resulted from some blunder in the firing of the charge after it had been prepared.	1	—
87	18 Dec.	Ditto -	Dinorwic Quarries, Llanberis	The deceased had poured about 60 lbs. of blasting-powder into a crack or crevice of the rock. He had put a fuze down, and prepared a straw to use (by dropping it down the crevice) if the fuse did not go off. He thought the fuze failed, and approached the shot, intending to use the straw, when the powder exploded, blowing him into the air and killing him.	1	—
88	18 Dec.	Dynamite (probably).	South Condurrow, Cornwall	A miner (named Williams) fired two holes; one of these, he thought, had missed fire, and without waiting he rushed in; the hole exploded and a stone struck him on the side.	—	1
89	21 Dec.	Dynamite -	Talargoch Mine, near Rhyl	Evan Williams put the dynamite into a tin, and fixed it over a lighted candle for the purpose of softening it. It exploded, killing him on the spot.	1	1
90	29 Dec.	Gunpowder -	Dolcoath Mine, Camborne -	A small stone from the hole, when blasted, struck a man named Ball on the head.	—	1
91	24 Dec.	Ditto -	Abingdon, Berkshire -	A gamekeeper (Stephen Gardiner) killed by the bursting of his gun.	1	—
92	27 Dec.	Ditto -	Kitchen of labourer's house at Milton, near Burslem.	Two children were left alone in kitchen, and one put a match into a glass containing gunpowder, which had been placed in a cupboard, to "see what it would do."	—	2

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					Killed.	Injured.
	1878.					
93	*16 Nov.	Gunpowder -	Carton Maynooth, co. Kildare.	The coroner's jury found that Matthew Finnerty died from the effects of injuries received by an explosion whilst blasting rocks.	1	—
94	30 Dec.	Ditto -	No. 16 incorporating mill in Messrs. Curtis and Harvey's Factory at Bedfont.	No one injured; cause of explosion unknown.	—	—
95	?	Ditto -	Greensplat, St. Austell -	Edward Cooper (a clay worker) had 4 lbs. of gunpowder on a table; the sparks from a piece of "safety" fuze, which he was trying, ignited the gunpowder, when an explosion occurred.	—	1
96	†9 Dec.	Ditto -	Private dwelling-house at Wingate Grange Colliery.	The deceased (William Eade) was making fuzes for blasting purposes in the bedroom of the house in which he lodged, when the powder exploded, scorching him severely. He died from lockjaw resulting from the injuries he received. It was shown in evidence given before the coroner, that the Colliery Company provide a proper place for manufacturing shots, and that the accident was caused altogether by the carelessness of deceased.	1	—
97	‡22 Mar.	"Tonite," *i.e.*, cotton powder.	Cotton Powder Company's Factory, Uplees Marshes, Kent.	Partial explosion No. 2 cartridge machine. Rest and spindle broken.	—	—
98	‡29 May.	Ditto -	Ditto - -	Rest broken (No. 1 cartridge machine).	—	—
99	‡16 Nov.	Ditto -	Ditto - - -	No. 2 cartridge machine. No damage.	—	—
100	‡19 Nov.	Ditto -	Ditto - -	No. 1 cartridge machine. No damage.	—	—
101	‡28 Nov.	Ditto -	Ditto - - -	Ditto - -	—	—
102	‡11 Dec.	Ditto -	Ditto - -	Partial explosion in one hole of No. 2 cartridge machine. Rest damaged.	—	—
103	‡30 Dec.	Ditto -	Ditto - - -	Ditto. No damage -	—	—
104	28 Dec.	Gunpowder -	Darkley Row, co. Armagh	A man purchased 1 lb. of gunpowder. He went with it into a house at Darkley Row; the powder fell into the fire, and exploded, injuring himself and five children. Two of the children subsequently died. The man was drunk.	2	4

* This accident was not reported until 30th December 1878.
† This explosion was not reported at the proper time.
‡ These accidents were not reported at the proper time.

15848D. APPENDIX W1.

EXPLOSIVES ACT, 1875.

REPLIES TO BE ADDRESSED TO HER MAJESTY'S INSPECTORS OF EXPLOSIVES, HOME OFFICE, LONDON, S.W.

SIR, Home Office, Whitehall, 15th February 1878.

I am directed by the Secretary of State to call your attention to the 2nd paragraph of the 28th section of the above Act, and to inform that he deems it necessary to obtain copies of registers of all Licenses and Continuing Certificates for Stores, and of all Licenses for Small Firework Factories, granted by the several local authorities under the Act, together with a statement of the *number* of premises registered with them, and accordingly I am to inform you that he hereby requires you to send to him, *not later than the 15th April* 1878, the following returns relating to the district within which the local authority to which you are clerk has jurisdiction :—

(*a*) Copy of register of Continuing Certificates for Gunpowder stores.
(*b*) „ „ of Store Licenses in force on 1st April 1878.
(*c*) „ „ of Small Firework Factory Licenses in force on 1st April 1878.
(*d*) Statement of number of premises registered with you on 1st April 1878.*

Where no Certificates or Licenses have been granted, or premises have been registered, it should be so stated. The returns (*a*), (*b*), (*c*), and (*d*) should in all cases be made on separate sheets.

I am at the same time to request that you will be good enough to furnish the name of the officer or officers appointed by the local authority under section 69, and of the superior officer (if any) acting within your jurisdiction under section 75.

I am, &c.
A. F. O. LIDDELL.

* The names and addresses of the occupiers of the registered premises need not be stated.

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APPENDIX X.

SIR, Whitehall, 4th June 1878.

I AM directed by the Secretary of State to transmit to you herewith a Memorandum of Suggestions for making more generally known to those concerned therein the provisions of the Explosives Act, 1875 ; and I am to point out, for the consideration of the local authority under that Act for the borough of _____, how desirable it is that the suggestions of the Memorandum should be carried out, and to recommend that each officer appointed by the local authority should be provided with the Guide Book to the Act ; and that arrangements should be made for distributing the "Summaries" mentioned in the Memorandum to the traders and occupiers of premises whose business is affected by the Act.

I am, &c.
The Town Clerk of A. F. O. LIDDELL.

MEMORANDUM of SUGGESTIONS for making more generally known the Provisions of the Explosives Act, 1875.

1. With a view to enable each officer appointed to act as an officer under the Explosives Act efficiently to perform his duties, it is expedient that he should have a copy of the official Guide Book to the Act, with which is incorporated the Act itself, and all orders made thereunder, and which can be obtained in a handy pocket-book form for 2*s.* of any of the publishers appointed by Her Majesty's Stationery Office, who are as follows:—W. Clowes and Sons, 13, Charing Cross ; Harrison and Sons, 59, Pall Mall ; W. H. Allen and Co., 13, Waterloo Place; W. Mitchell, 39, Charing Cross ; Longman and Co., Paternoster Row ; Trübner and Co., 57 and 59, Ludgate Hill ; Stanford, Charing Cross ; H. S. King and Co., 65, Cornhill ; Knight and Co., 90, Fleet Street; and Ford and Tilt, 52, Long Acre ; Shaw and Sons, Fetter Lane, and Crane Court, E.C. ; and Waterlow and Sons, 24 and 25, Birchin Lane, E.C., and 49, Parliament Street, S.W. ; also by Griffin and Co., the Hard, Portsea ; A. and C Black, Edinburgh; Alex. Thom, Abbey Street, and E. Ponsonby, Grafton Street, Dublin.

2. For the information of traders and of persons keeping explosives six Summaries have been prepared, setting out the principal points to be attended to in small firework factories, stores and registered premises, respectively, as follows :—

Summary No. 1. Relating to small firework factories.
„ 2. Relating to stores for gunpowder under License.
„ 3. Relating to stores for gunpowder under Continuing Certificates.
„ 4. Relating to stores for mixed explosives.
„ 5. Relating to premises registered for gunpowder.
„ 6. Relating to premises registered for mixed explosives.

These can be purchased for 1*d.* each of any of the publishers above named.

If arrangements could be effected, either for causing each occupier of a small firework factory, store, or registered premises to be supplied with a copy of the Summary which affects his particular place of business, or to bring the Summaries under the notice of such persons, it is probable that the officers would be greatly assisted in the discharge of their duties by the more general knowledge of the law which would thus be obtained by those whom the law principally affects, and that, from the same cause, the observance of the law would be better secured.

APPENDIX Y.

CIRCULAR.

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23785 M.

Royal Irish Constabulary Office, Dublin Castle,
21st September 1878.

THE EXPLOSIVES ACT, 1875.

(38 Vict. c. 17.)

1. The Government being anxious to ascertain whether there are in Ireland explosives in contravention of the Explosives Act, 1875, the attention of the constabulary is hereby specially directed to the powers conferred on them by section 73 of the above-mentioned Act, which is as follows :—

"Where any of the following officers,—namely, any Government inspector, or any constable or any "officer of the local authority, if such constable or officer is specially authorized either (*a*) by a warrant "of a justice (which warrant such justice may grant upon reasonable ground being assigned on oath), "or (*b*) (where it appears to a superintendent or other officer of police of equal or superior rank, or to "a Government inspector, that the case is one of urgency, and that the delay in obtaining a warrant "would be likely to endanger life) by a written order from such superintendent, officer, or inspector,— "has reasonable cause to believe that any offence has been or is being committed with respect to an "explosive in any place (whether a building or not, or a carriage, boat, or ship), or that any explosive "is in any such place in contravention of this Act, or that the provisions of this Act are not duly "observed in any such place, such officer may, on producing, if demanded, in the case of a Government "inspector, a copy of his appointment, and in the case of any other officer his authority, enter at any "time, and if needs be by force, and as well on Sunday as on other days, the said place, and every "part thereof, and examine the same, and search for explosives therein, and take samples of any "explosive and ingredient of an explosive therein, and any substance reasonably supposed to be an "explosive or such ingredient which may be found therein.

"Any person who, by himself or others, fails to admit into any place occupied by or under the "control of such person, any officer demanding to enter in pursuance of this section, or in any way "obstructs such officer in the execution of his duty under this section, shall be liable to a penalty not "exceeding fifty pounds, and shall also be liable to forfeit all explosives, and ingredients thereof, "which are at the time of the offence in his possession or under his control at the said place.

"Where a constable or officer of the local authority, specially authorized by written authority other "than a warrant of a justice of the peace, enters and searches as above provided, a special report in "writing of every act done by such constable or officer in pursuance of that authority, and of the "grounds on which it is done, shall be forthwith sent by the person by whom or under whose authority "it was done to the Secretary of State."

2. Each sub-inspector will accordingly make careful inquiry with the view of ascertaining definitely whether there are in this district any explosives in contravention of the aforesaid Act, and if it should appear on such inquiry that there is reasonable cause to believe that explosives are so kept, a search warrant should be obtained by the constabulary from a magistrate upon a proper information, and a careful examination and search should be made of the place in which the explosives are believed to be kept, and, if necessary, samples taken of any explosives and ingredient of any explosive therein, and any substance reasonably supposed to be an explosive or such ingredient which may be found therein.

"Explosive" is defined in section 3 of the "Explosive Act, 1875," and classified by Order in Council, No. 1, made under the same.

After such search has been made, the sub-inspector will report the result, separately in each case, in the three first columns of the following form, to his county inspector, who will forward the same to the inspector-general.

County of _____

District of _____

Premises searched.		Result of Search.	Decision of Government.
Name of Occupier.	Situation		

With the view of facilitating the prompt action of the constabulary, a draft form of information to be made by them, and a draft form of warrant which may be issued by a justice (as approved by the law adviser), are herewith transmitted.

3. Section 120 of the Act defines the expression "chief officer of police" to mean :—(1) in the police district of Dublin metropolis the chief commissioner of police for the said district, and in his absence the assistant commissioner of police for the said district ; and (2) in the town of Belfast, the town inspector, and in his absence the sub-inspector of the Royal Irish Constabulary acting for him ; and (3) elsewhere in Ireland the sub-inspector of the Royal Irish Constabulary, and in his absence the head constable of such force acting for him.

Accordingly, the town inspector of Belfast, and elsewhere the sub-inspectors in charge of districts, are directed to exercise the powers vested in any "chief officer of police" by the 75th section of the Act.

4. Copies of the "Guide-Book" to the Explosives Act, 1875, and to the Orders in Council, &c. under that Act, will be transmitted for the use of county inspectors and sub-inspectors and of the constabulary in important towns.

G. E. Hillier,
Inspector General.

APPENDIX Z.

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EXPLOSIVES ACT, 1875.

(38 Vict. c. 17.)

Sir, Whitehall, 16th November 1878.

In consequence of some coroners having, notwithstanding the Home Office Circular of 30th September 1876 on this subject, omitted to send to the Secretary the notice required by section 65 of the above Act, of the time and place of inquests held on the bodies of persons killed by accidents connected with explosives, I am directed by Mr. Secretary Cross to draw your particular attention to the provisions of sections 63 and 65 of the above Act, and to point out that, under section 65, notice of an inquest is required to be sent, not merely in cases where the death has been caused by any accident notice of which is required by section 63 to be given to the Secretary of State, but in every case where the death is caused *by the explosion of any explosive.*

I am to request that these provisions may for the future be strictly observed; and I am at the same time to remark, that is desirable that, in sending any notice, you should furnish such particulars of the accident as you may be in possession of, and which, in your judgment, are likely to be of assistance in determining whether the case is one in which the attendance of a Government inspector at the adjourned inquest is likely to be useful.

I am, &c.,
A. F. O. Liddell.

LONDON:
Printed by George E. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
Fo Her Majesty's Stationery Office.

2.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending an Explosion of Dynamite in Carn Brea Mine, Redruth, on the 27th September 1878.

BY

MAJOR V. D. MAJENDIE, R.A.,

H.M. CHIEF INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, 30th October 1878.

I HAVE the honour to report that, in obedience to your Order of the 1st October 1878, H. O. $\frac{77786}{7}$, made under the 66th section of the Explosives Act, 1875, I have held an Inquiry into the circumstances attending an explosion of dynamite, which occurred in Carn Brea Mine, near Redruth, on the 27th September 1878, by which two men were killed, and three others sustained injury.

I also attended the adjourned inquest on the body of one of the deceased (Knuckey), which was held on the 8th instant, at Redruth, by Mr. Carlyon, one of the coroners for the county of Cornwall. I did not consider it necessary to attend the second adjourned inquest, which was held by the same coroner, on the 10th instant, on the body of the other deceased (Allen).

I desire to record the very great assistance which I received in making my inquiry from Dr. C. Le Neve Foster, H.M.'s Inspector of Mines, as also from Mr. Teague and the other officials of the Carn Brea Mine, and from Mr. Goffin, the local agent of the Diamond Rock Boring Company.

In accordance with the provisions of the above-mentioned section of the Act, I beg to furnish the following Report:—

Circumstances of explosion.

The Diamond Rock Boring Company (Limited), of Crown Works, Guildford Street, York Road, Lambeth, London, are engaged under contract in sinking a shaft of 12 fathoms deep and about 15 feet wide, below the 226 fathoms level in the Carn Brea Mine near Redruth. The work is carried on under the immediate superintendence of Mr. Goffin, in the employ of the Diamond Rock Boring Company, and this Company supply the necessary men, machinery, and material.* About 8 fathoms of the required 12 have been sunk, the operation being carried on mainly by a system of blasting with dynamite, the blast-holes being made by means of percussion drills driven by compressed air. The rock is of an exceedingly hard character, being part of the tin lode, and technically known as "capel," and may be described as a hard silicious rock. The dynamite is drawn from the licensed store of the Carn Brea Mine Company, and is manufactured by the Nobel's Explosives Company, and supplied by their agents, Messrs. Rich and Son, of Redruth. The detonators are also supplied by Messrs. Rich, and are of Messrs. Egestorff's make. In carrying on the operations it is usual to employ seven men in each shift, one of these men being in charge, and responsible for the position, planning, and preparation of the holes. He also charges and fires the holes. The responsible man in the shift which was at work when the accident occurred was J. Craze, but this man was not in the shaft at the time of the accident, having gone to surface several hours before, his place having been taken by his brother, E. Craze, who, in fact, had charged and fired the last round of holes before the accident, though J. Craze had subsequently been in the shaft, and had given directions as to the boring of the fresh holes.†

* As a matter of fact, I believe that the contract is sublet to the workmen by the Diamond Rock Boring Company, who supply machinery and material.

† Another of the shift was away at the time of the accident.

It is the practice to drill a group of holes, which are then charged and fired; after which the débris produced by the explosion is removed, and the drilling of fresh holes commences. The dynamite for the purpose is taken from a box, which is kept in a safe place in the level above, and only brought down into the shaft when the holes are ready to be charged. The primers have the detonators and fuze (gutta-percha-covered "safety fuze") attached above ground, and are sent down all ready prepared. The men below know how many charges will be required, and only about the amount of dynamite actually required is sent down the mine. Immediately before the holes are charged, the water and small débris are pumped out of each blast-hole by means of a rude hand-pump, which consists of a portion of an old gun-barrel fitted with a piston. Directly the charges have been inserted each hole is closed at the top with clay to prevent any more water from getting into it (the amount of water trickling into the shaft being considerable), and the charges are fired usually within about two or three minutes after being so inserted, and after the claying of the holes has been completed, the firing being effected in the usual way by igniting either a piece of touch-paper or a small piece of tallow candle called a "snuff," which is applied to the end of the fuze. The fuze is cut sufficiently long (about four feet*) to afford the man who fires the holes full time to withdraw from the shaft into a place of safety above. The firing of the holes is therefore not simultaneous, but the shots go off in rapid succession. The holes have a diameter of about 3″ at the top; and, smaller drills being used for the lower portions, they narrow to about $1\frac{3}{4}$″ to $1\frac{1}{4}$″ (accordingly as the drill has worn more or less). The depth of the holes varies from about $1\frac{1}{2}$ feet to 3 feet. The charges used are not considerable, being rarely, if ever, over 1 lb., and sometimes being under $\frac{1}{2}$ lb. The depth of hole and amount of charge are adapted to the character of the work to be performed and the local effect required to be produced, and it is one of the duties of the head man of each gang to settle this.

Such is the usual practice, and from this practice there appears, so far as I can discover, to have been no material deviation in the present instance.

At the time of the explosion there were present in the shaft six men, viz., Knuckey (killed on the spot), Allen (died in hospital about 48 hours afterwards), Hancock, Paull, and Cocks (all injured), and a lad called Rowe (who escaped without injury). The man Hancock belonged, I understand, to the next shift. The shifts were in the act of changing and Hancock had descended to take up his work. The other men were endeavouring to start some new holes before the next shift all arrived, when they would have given up their places and gone to surface.

It appears that the last shots had been fired at about a quarter to five o'clock on the preceding evening (26th September). They consisted of two groups,—one of three holes and one of eight holes. With the latter it is unnecessary to concern ourselves, for they were not in the part of the shaft where the accident occurred, and could not have been in any way connected therewith. These are the holes numbered 4 to 11 inclusive on the accompanying plan.

The holes with which we are concerned composed the group numbered 1, 2, 3 on the plan. These holes, according to the testimony of E. Craze, were of the following depths, and contained the following charges:—

—	Depth.	Explosives employed.		Total length of Explosive in hole.
		No. of Cartridges.	Weight.	
			lbs.	
No. 1 -	18 inches -	3 and a primer -	$\frac{3}{7}$	10 inches (with primer).
No. 2 -	34 „ -	4 and a primer -	$\frac{4}{7}$	13 „ (do.)
No. 3 -	36 „ -	4 and a primer -	$\frac{4}{7}$	13 „ (do.)

Exclusive, in each case, of primers.

N.B.—The squeezing of the cartridges would reduce each of these lengths by from 1″ to 2″.

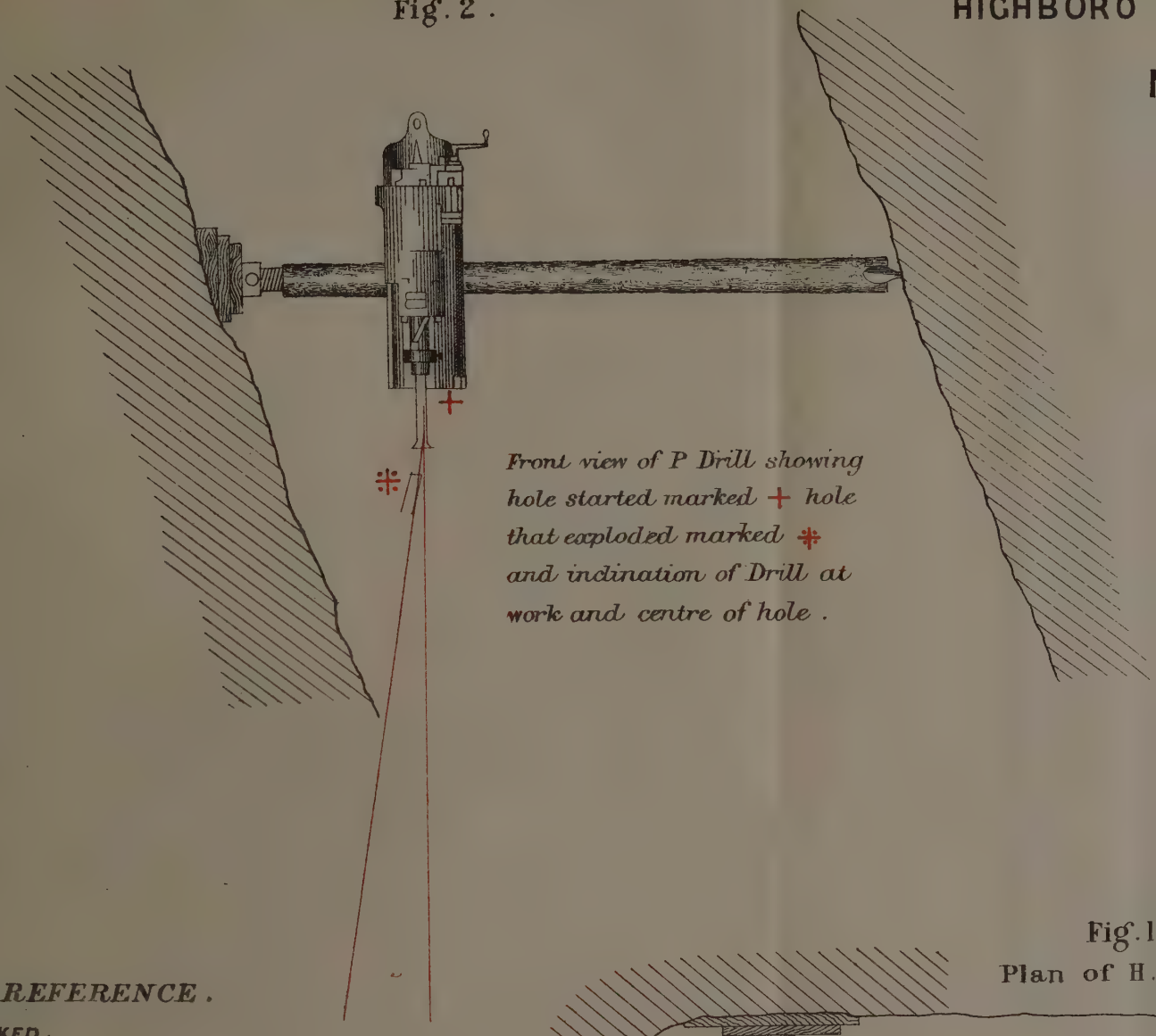
E. Craze had himself cleared the water from the holes before charging; but it was unavoidable, he says, that a little water should have run in after the holes were cleared, and before the charges were inserted. After they were inserted, the clay is presumed to have prevented any more water from entering. The holes were charged and fired

* This length of fuze will give a time of burning of rather over a minute.

CARN B

HIGHBORO

Fig. 2.



Front view of P Drill showing hole started marked + hole that exploded marked ⁜ and indination of Drill at work and centre of hole.

Fig. 1

Plan of H

REFERENCE.

Fig. 1.

MARKED.

- N°1 ⁜ — *Hole that exploded.*
- \+ ● — *Starting point of Jumper.*
- □ — *Position of Men.*
- a — *Machine at Work.*

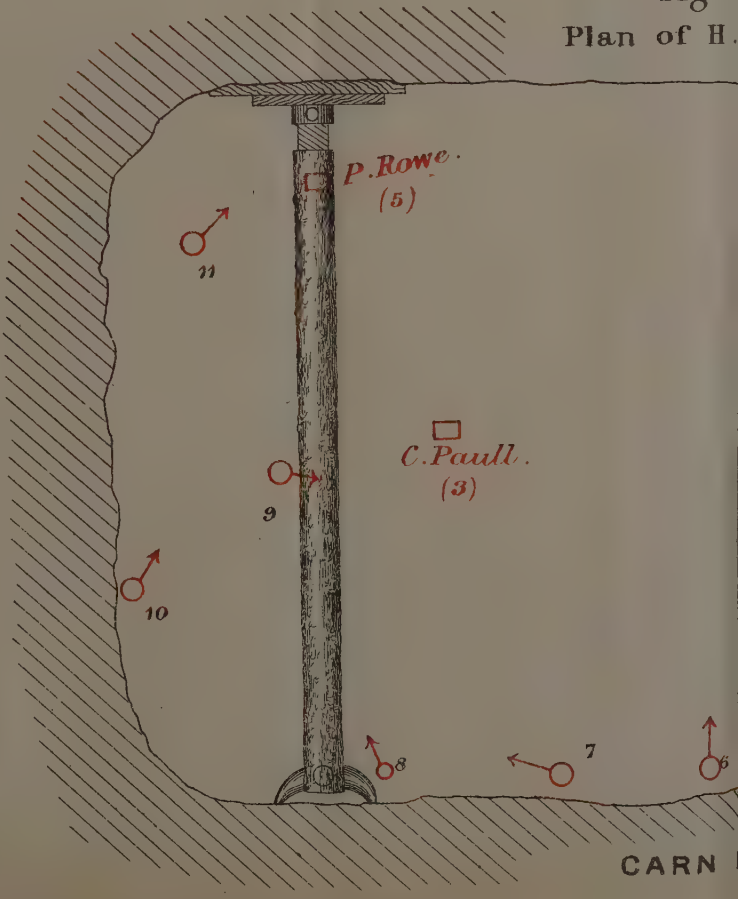
Fig. 2.

- ⁜ — *Front view of hole exploded*
- \+ — *Position of Starting point of Drill.*

Fig. 3.

- A + — *Section thro' starting point*
- B ⁜ — *of Drill and Hole N°1.*

Holes previous to blasting N°1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.



CARN

Wm Coaker.
Octr 4th 1878.

CA MINES.

VEST SHAFT.

Section showing where hole was started and Drill found.

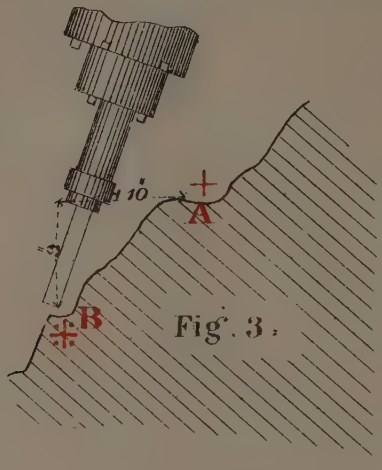
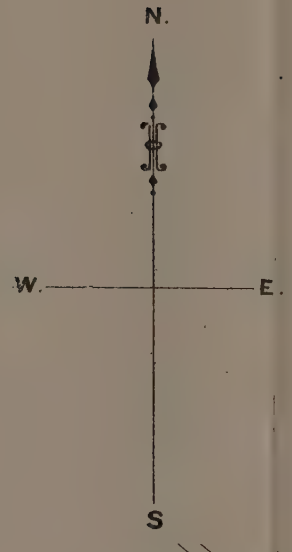
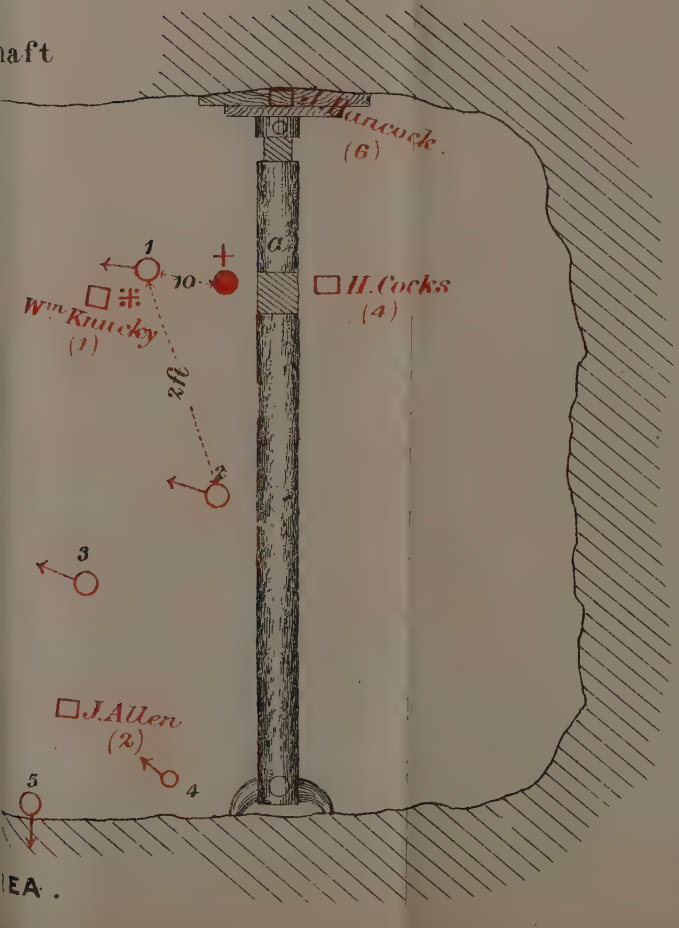


Fig. 3.





by E. Craze, who is positive that they were correctly charged. The dynamite was in an unfrozen, plastic condition. The holes were charged about three minutes before being fired. Craze lit the holes in the order in which they were numbered; and he is satisfied that they all three exploded; and he says that he noticed no more difference in the loudness of the reports than would reasonably have been expected from the somewhat smaller charge in No. 1; in fact, he felt sure that all the holes had fully gone off. After these holes had been fired the group of eight holes was charged and fired; and then the clearing away of the débris commenced. E. Craze left the shaft before the clearing away was completed; and he was not concerned in any way in giving directions as to the boring of any new holes. The responsibility as to this rests with J. Craze, who, having descended the shaft after the blast, and having examined the results of the blast (at about 5.30 a.m. on the morning of the accident), came to the conclusion that another hole must be bored in the neighboured of hole No. 1, where the rock had not been sufficiently removed. He gave orders accordingly. He stated that he subsequently observed that this hole had not torn away completely to the bottom. He thinks there "may have been two or three inches" of the hole left. He probed the hole, and satisfied himself that it was not fully torn away; but he does not appear, after ascertaining that there was some of the hole left, to have pushed his inquiries further, to ascertain how much of the hole there was left, or whether there was any explosive left in it. In fact, he says that he did not ascertain whether there was or was not any dynamite left in the hole. There was water, and there was débris,—this he found; but whether there was any dynamite left he does not know. It is the more surprising that, finding the hole in this condition, he did not make a more minute examination on this point, seeing,—first, that he had given directions for a new hole to be bored at only about a foot from the old one; and second, that he had, within his own personal experience (at West Basset Mine), known a case where a hole had partially exploded, and in the bottom of which hole he had found and withdrawn therefrom some unexploded dynamite. To this neglect on the part of Craze, as will appear, I consider this lamentable accident may most probably be attributed.

It is right that I should state that Craze's statement was made to me before the inquest in the course of my inquiry, and that at the inquest he withdrew this statement altogether, and said he never saw any of the old hole before or after giving orders to bore the new one, and that he never probed it, and that he never intended to make any statement of the sort. But both Dr. Foster and myself had taken down the statement independently in almost the same words; and I regret to have to report that I am of opinion that Craze had recognized the gravity of the admission after making it, and before the inquest, and that his evidence given at the inquest on this point is wholly unreliable.

Craze does not appear to have informed the men at the drill that he had found this hole partially undestroyed. Both Hancock and Cocks informed me that they had no idea that they were near an old hole. Indeed, Cocks had tapped with a hammer around the place of boring, and had remarked that "it seemed a pretty sound place." He had also assisted in removing the débris about that part, and had observed no hole. The drilling of the new hole commenced a short time before the accident. It is tolerably evident, from certain marks in the rock, at what point the first blows were struck by the drill (viz. at a point shown on the plan at about 10 inches from old hole). But the drill, which is fixed by clamps on a cylindrical bar, has a tendency to slip in that direction in which the operation of the drill is easiest.* If one side of the rock is lower than another the drill tends to slip towards the low side. No sooner had the drill got to work than it slipped. It was immediately screwed up again on the shaft. It however slipped again. From the accounts given to me it must have slipped more than once, and it seems doubtful if it was ever really tightened upon the bar in the position originally assigned or intended to be assigned by Craze. Each slip of the drill, in the direction in which it is stated as a matter of fact it actually did slip, would tend to bring it nearer and nearer to the old hole. At any rate, whether from the effect of slipping, or from the men having at last abandoned the attempt to keep it in its original position,† *it is certain that after the accident the drill was found* (*and seen*

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* The drill receives its lateral direction by the position in which it is clamped on the shaft.

† It must be borne in mind, first, that they had no particular reason for believing that it was necessary to avoid letting the drift take a direction differing somewhat from that assigned: they knew of no old hole, and had no suspicion of possible danger. Second, they were hurrying over the work to make a start before handing it over to the new shift.

by Dr. Le Neve Foster and myself) pointing immediately over the old hole,—10 inches from the spot where, according to J. Craze, he had directed the hole to be made.

It was, then, while the drill was in this position, and when it had given one or two "jumps" (*i. e.* strokes), that the accident occurred. There was an explosion immediately under the drill. The man Knuckey, who was personally guiding the drill, and had his face over the hole, was killed on the spot, and all the other men in the shaft (except Rowe) were more or less injured. Allen died the following Sunday. The position of each of the men is shown, so far as can be ascertained, on the accompanying plan.

The explosion is described by the injured men and by Rowe as not having been a very loud one; and though some deduction must be made from this impression, on the ground that the noisy percussion drills were at work, this deduction must to a great extent be regarded as counterbalanced by the fact that none of the men had ever before been in so close and narrow a space when a charge of dynamite exploded, or in such immediate proximity to such an explosion. Two of the men described the noise as having for the moment given them the impression that the hose-pipe by which the compressed air is conducted to the machines had burst.

Effects of explosion.

The effects of the explosion, except to the men, were insignificant. The other drill was hardly "dusted" (as one of the men expressed it) by the thrown-up débris. The drill over the hole was not broken, bent, or disturbed, and apparently very little fresh rock was broken up. E. Craze states that he fancied the hole had been somewhat more broken away after the explosion.* But, however this may be, it is certain that after the explosion, as I had an opportunity of acertaining by personal observation, there were still a few inches of the hole left unbroken. The accident, then, occurred at the exact moment of the application of a few strokes of the drill in the immediate vicinity of an old hole, and it occurred obviously through the drill striking or communicating a blow through something else to some explosive which was present at that part of the shaft.

Consideration of possible causes of explosion.

A little consideration will, I think, serve to show that the accident can only be referred to one of two possible causes—†

1st, to the presence of some dynamite which happened to be lying about:—

2nd, to the presence of some unexploded dynamite.

I propose to offer some observations on each of these two possible causes, with a view to estimating, as far as may be practicable, the degree of probability respectively attaching thereto.

Consideration of first possible cause: Dynamite left about.

1*st. Dynamite left about.*—Assuming the possibility of any dynamite being left lying about, the accident might have resulted either—

(*a.*) From the dynamite so lying about being itself struck; or,

(*b.*) From some nitro-glycerine which had exuded there from being struck. In either case the blow might have been direct, or communicated to the explosive through some of the hard débris.

As regards (*a.*) the striking of any dynamite which might have been lying about, it is obvious that this would be almost certain to entail an explosion. The shaft, as has already been stated, is being driven through very hard rock, the débris of which is of almost metallic hardness; and a piece of dynamite receiving a sharp blow when in contact with such a substance, a blow such as the percussion drill would be liable to give or communicate, would almost certainly be exploded.

So also with regard to (*b.*) the striking of any exuded nitro-glycerine from any dynamite which might be lying about. An explosion could in this case hardly fail to result from a blow such as the drill delivers.

If any dynamite had been lying about in this wet shaft it equally admits of no doubt that there would have been a liability to the presence of exuded nitro-glycerine.

It is a perfectly well established fact that if dynamite be brought into contact with water, the nitro-glycerine becomes gradually expelled, and the dynamite, so to speak,

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* See passage at page 3 relative to Craze having denied at the inquest that he ever saw the old hole before the explosion. Of course, if this denial is to be relied upon, it makes nonsense of the statement, which he undoubtedly and very distinctly made to Dr. Foster and me, that when he saw the hole after the explosion it was somewhat more broken away than when he saw it before the explosion.

† We may dismiss the possibility of the accident having been due to spontaneous ignition on the part of the dynamite, because even had the dynamite been exceptionally impure, the temperature of the wet hole (wet, because water had been trickling into it after the first blast for hours) would not have been such as to have rendered any destructive chemical action possible, and, as a matter of fact, Dr. Dupré's report on a sample of dynamite taken from the same box shows that it was of fairly good quality, and passed the heat test which is usually applied to this class of explosive. (Report on sample 299.)

dissolves. This property of dynamite to part with its nitro-glycerine in the presence of water has, undoubtedly, been the cause of more than one accident;—among which may be mentioned the Hamilton explosion of 1876, the Penn Ricca and Cwmbran accidents of 1877, and two accidents at the Yarlside Mines during the present year. Dr. Foster, in his report for 1876, refers four out of six accidents to this cause, and gives some interesting particulars of an accident of this class at the South Roskear Mine on the 6th September 1876. (See Report, p. 9.)

In my Report on the Hamilton accident, and in Major Ford's Report on the Yarlside accidents, this dangerous property of dynamite is dealt with very fully, and the consequences of such exudation as necessarily occur when dynamite is brought into contact with water are carefully explained. It is therefore unnecessary to travel over this ground again; it will be sufficient to repeat here that the property is one which cannot be too generally known among those who have to use and handle dynamite, and that it is a risk which should ever be present to the minds of those who have to employ dynamite in wet places.

In the present instance, if it could be established that there had been dynamite lying about, it would not be necessary to travel further for an explanation of the accident; and it would not even be necessary to show that the dynamite had been present in the particular spot where the accident occurred, for the exuded nitro-glycerine would be liable to flow to a distance from the spot where the exudation commenced, and so extend the danger to fresh localities. Accordingly, I directed my inquiries carefully to ascertaining whether there was any probability of dynamite having accidentally been left about. It appears to me that, while such a result was not impossible, it was not, under the existing order of things, a very probable one. The arrangements appear to have been careful and good on this point. As already stated, only approximately so much dynamite as was required was brought into the shaft. The dynamite so brought was in a substantial wooden box, provided for the purpose, and having a lock and two keys; one of which was kept in the level, the other in the magazine. The charges were not carried loose from the level into the shaft, but the whole box was taken down, and the man engaged in charging the holes took the cartridges one by one from the box, and placed them in the hole. Again, it is stated that cartridges were never broken in two to make up a charge (by which means broken pieces might have fallen about). It is, of course, not impossible that there may on some occasion have been a departure from this careful system, and that a cartridge may have fallen or have been laid down in the shaft and overlooked.* And if this had happened, it would account for the explosion; but I consider that this cause, though it must be included among those which are possible, does not in the present instance commend itself as the most probable cause.†

Consideration of second cause. Presence of unexploded dynamite.

2*nd. Presence of some unexploded dynamite.*—In dealing with this point I conceive that it is necessary to show not only that it is theoretically possible for dynamite to remain unexploded after a blast, but that such a result is actually not an uncommon occurrence. As to this last fact there is ample testimony.

In investigating an accident which occurred at the Festiniog tunnel in August last, Major Ford ascertained that the workpeople frequently found unexploded cartridges, both of dynamite and tonite, in holes which had been charged with these explosives respectively, and the upper parts of which holes and charges had been blown away. One of the men engaged in blasting told Major Ford that "on one occasion, after 30 "holes had been fired, he met with no less than seven parts of holes containing one or "more cartridges, the rock not being blown away clear from the bottom of the holes." The foreman of one of the shafts "produced a box containing upwards of 50 cartridges "(of tonite), which he stated had been found in holes in his shaft."‡ A man called John Thomas, employed as a blaster at South Roskear, informed me he had had *several* cases of dynamite left unexploded in holes from which the upper part had been blown

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* Some evidence was given at the inquest, on behalf of the Nobel's Explosives Company, to show that the leaving about of cartridges had occasionally occurred. But the evidence certainly did not to my mind satisfactorily establish that cartridges had ever really been so found; at least, not cartridges which had not been in blast holes. One witness said he inferred, from the appearance of the cartridges he found, that they *had* been in blast holes, and were parts of unexploded charges. The other witness on this point gave an account of such intrinsic improbability, that I think it may be dismissed as unreliable; for it is impossible that cartridges could, after lying about in water (as they would be at the bottom of this shaft), have found their way (as he stated) whole up in the buckets with the débris, and travelled whole to a place where he subsequently found them.

† See passage at page 9, relative to the possibility (but improbability) of the accident having been due to some dynamite which had, unobserved, escaped explosion in a hole fired or intended to be fired at some period before the occident, and having remained on a piece of débris which may have been lying about.

‡ "This appears to have happened just as frequently with dynamite as with tonite."—Major Ford's Report of 29th September 1877.

away. He had had one such case in the week in which the present accident occurred, and had himself found about ½ lb. of dynamite in one of the group of eight holes, the original charge of which had been from 1¼ lbs. to 1½ lbs.

Other instances of this can be named. Thus, at Carn Brea Mine, on the 4th September 1876, an accident of this sort occurred:—a man and a boy (Joseph Whitworth and James Kemp) had fired three holes with dynamite, and they heard three reports; but when they entered the "stopes" they found that one of the three had "torn only part of its burden," and whilst engaged in taking out the débris from the remainder of that hole, some dynamite which had been left in it exploded. Asked by Dr. Foster how they were taking out the débris, they said they were boring out the hole, intending to bore it deeper. Asked how they supposed a portion of the charge remained unexploded, they said they could not tell, unless through the interruption caused by the fold of paper at the end of each cartridge forming a division. In this case the man lost two fingers.

On the 3rd March 1876, at the Carn Brea Mines, two men (James Matthews and Francis) were injured in this way:—they had fired a hole, part of the dynamite exploded, and after the lapse of a quarter of an hour they resumed labour, but while they were working the remainder of the hole exploded.

At the Mark Valley Mine, about four or five years ago, a man named John Gill was engaged in driving a level. He bored and fired two holes with dynamite; one hole was in the "bottom" of the level, the other was in the "face," some little way up: the level was a dry one. The hole in the bottom was bored two feet deep, and charged with two cartridges of dynamite and a primer. The two holes were fired together; both went off. The bottom hole did not tear the rock right to the bottom, but left an inch or two. This was on a Friday. Gill looked into the bottom: the hole looked "clean." On the Saturday and Monday they were boring and, blasting in the "face," and on the Tuesday they went to split up the bottom with a tool, and, while so engaged, an explosion took place, which nearly killed Gill. He is quite sure the upper hole could not have been blown off the collar of the hole in the "bottom," but says that dynamite *must* have been left unexploded in this hole.

In his Report for 1876 Dr. Foster says, "It cannot be denied that the whole of the "dynamite in a charge does not always go off when a shot is fired, as some "occasionally remains as a source of danger to the workmen, ready to explode when "struck with the pick or borer."

In the Festiniog cases a system of so-called simultaneous blasting was adopted; and Major Ford is of opinion that what had happened there was, that as there was not absolute identity in point of time in the explosion of the holes of a group, the holes which first exploded had in some instances blown away the upper part of the adjacent holes, with the primer and upper part of the charge, before the primer had time to act, and thus the lower part of the charge was left unexploded.* I am not prepared to dispute that the Festiniog cases may be explained in this way; and the same explanation perhaps fits the cases at South Roskear, mentioned by John Thomas, since the holes were there also fired in groups. But this explanation does not meet the case of single holes, of which the upper part had blown away, and in the lower part of which some dynamite remained unexploded. And there is, I think, no doubt that such cases have occurred. At South Wheal Crofty Mine near Camborne, an accident occurred on 12th May 1877, by which a man lost his life. Major Ford investigated this case, and attended the inquest, and expressed his opinion to the jury that the most probable explanation of the occurrence was that the detonation had been interrupted by some earth (or other impediment) which had got in between the cartridges. Dr. Foster also came to the conclusion that this accident was due to the explosion of some dynamite which had not gone off when the hole was blasted the first time. At the inquest a witness (William Rogers) stated that he had himself seen dynamite burning (*i.e.* not exploded) in the bottom of a hole, after the hole had exploded.

In the course of my inquiry into the present case, J. Craze stated that at West Bassett Mine he had known a case of a "single hole" (*i.e.* not one of a group) wherein, after the explosion of the upper part, he found, and withdrew therefrom, about half a dynamite cartridge. In the case at Mark Valley above mentioned it will be observed that the injured man is positive that the hole in the "face" could not have affected the hole in the "bottom," in which latter unexploded dynamite undoubtedly existed. Possibly other instances might be collected; but the evidence seems to point clearly

*At the inquest Mr. Orlando Webb, on behalf of the Nobel's Explosives Company, read some extracts from a work on quarrying, in which it is stated that a frequent cause of accident in the St. Gothard tunnel has been the explosion of portions of a charge left in a hole after the upper part had been blown away by the action of a neighbouring charge.

to the possibility of dynamite remaining unexploded in a hole from which the upper part has blown away, even in the case of a "single hole," while in the case of groups of holes such occurrences as I have shown are far from uncommon.

The question then arises, how can a portion of the charge be left in a hole after the upper part has gone off? I am of opinion that this result may certainly be produced by a combination of two conditions; and I am of opinion that it is not impossible for it to be produced by one (if not both) of these causes separately. The conditions or causes are,—

1st. The employment of a weak detonator.

2nd. The interposition of an inert body in the column of explosive.

Possible non-communication of explosion derived from a weak denotar.

As regards the former of these conditions, it is certain that a weak detonator may be fired in the middle of a primer without exploding or even inflaming it. Thus, tonite requires a more powerful detonator than dynamite; and a detonator such as is used for exploding dynamite does not invariably explode tonite. Nitro-glycerine itself may be detonated in contact with compressed gun-cotton without exploding and sometimes without even inflaming it.* Gunpowder fired upon dynamite will not invariably explode it; and it is certain that a detonator containing a very small charge of fulminate (*e. g.* an ordinary percussion cap) would not fire dynamite. Consequently, if we assume the employment of a detonator which, from some error in its manufacture, does not contain the charge of fulminite requisite to explode the dynamite, we shall have the explosion of the detonator, and not of the dynamite. This result is analogous to that which occurs when a piece of dynamite is struck on an anvil, where the portion struck is exploded, and the remainder merely dispersed and perhaps not inflamed. But I have no doubt that it is possible for the detonator to be strong enough just to ignite or explode the primer, and yet not with sufficient force or effect to detonate the rest of the charge. Mr. McRoberts, chemist of Nobel's Explosives Company, informed me after the inquest that in the earlier days of dynamite, when the detonators were frequently defective, it was a very common occurrence for a detonator merely to ignite a primer, and for the ignition thus established to proceed no further.

In his valuable treatise "On the Transmission of Detonation," Mr. Abel remarks, as a conclusion from a large number of interesting experiments recorded in this memoir, that "when the conditions essential to the transmission of detonation are "only on the verge of being fulfilled, or when some slight accidental impediment has "arisen, a result is frequently produced which is intermediate between the sudden "explosion distinguished as detonation, and simple mechanical disintregation and dis-"persion of the material (accompanied occasionally by inflammation of the particles)† ". . . . . In all these instances the violence of the concussion transmitted "was obviously only just bordering upon that required for the development of detonation, "and it appears most probable that only some small proportion of the mass of fulminate "or gun-cotton‡ was in a condition or position favourable to the operation of the "explosive force . . . . The remainder of the mass would then be dispersed by "the gases developed from the detonated portion. In some instances the particles would "be inflamed at the moment of their dispersion, in others they would even escape "ignition.§" Here we have precisely the conditions assumed. A detonator sets up a detonation in the primer; but, being a weak detonator, the violence of the concussion transmitted was "only just bordering upon that required for the development of "detonation" in the portion subject to the immediate and direct influence of the detonator, and the remainder of the mass is merely "dispersed by the gases developed "from the detonated portion;" exactly as in the case of a blow on the explosive on an anvil,—the portion struck is alone detonated, and the rest is dispersed. It may be urged of course, that in the case of a blow on an anvil, the portion dispersed, not being tightly confined, is free to move, and that therefore the case of explosive in a blast hole with a primer (weakly) detonated above it is not analogous. But to this objection it may be replied:—

1st. That in some experiments made by Mr. Abel, in which portions of gun-cotton were detonated by being struck, the mass was confined above and below, between two smooth brass plates, so that freedom of movement of the particles was considerably hampered.

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* Abel "On the Transmission of Detonation." Mr. Abel states that he has even detonated as much as 4 oz. of nitro-glycerine on compressed gun-cotton without detonating the latter.

† Such inflammation as the witness Rogers in the South Wheal Crofty inquest stated he had observed.

‡ The observation would apply equally to dynamite.

§ Abel "On the Transmission of Detonation."

2nd. That in the case of a detonator going off in a primer without exploding the primer, we have, in fact, an exact instance of a (weak) detonation not communicating to a mass of explosive confined on all sides.

3rd. There are no grounds for alleging that in all cases the explosive is actually in contact with the bottom of the hole. It may easily happen (especially if the drill has worn somewhat) that the explosive, fitting tightly, is not forced down to the bottom, and in such cases the particles would have freedom of motion downwards.

In short, if we regard detonation as the effect of a more or less violent concussion, the exertion of so much mechanical force,* it is easy to believe that the force which (as in the case of the blow on an anvil) suffices to ignite the particles to which it is immediately applied, may not explode those particles with sufficient violence to communicate an effective blow to the remainder of the mass; but, owing to the confinement of the charge, what might in the open be only a very feeble explosion, or even an ignition, may assume, in the hole, the proportions of a decided *explosion*, though not one of that first order which would entitle it to be classed as a *detonation*.†

And thus it is, I think, quite possible to conceive an explosion proceeding no further than either the detonator or the primer.‡

Possible interruption of explosion in a column of explosive.

But, secondly, the interposition of an inert body in the column of explosive would certainly tend to produce the same result. If the arguments and considerations which have been advanced above in favour of the supposition that explosion effected by a too weak detonator may be arrested without traversing the whole column of explosive be correct, it is, I conceive, not impossible that detonation may also be arrested, even where the initial detonation is a more powerful one, by the interposition of some inert body. As I have stated, Major Ford came to the conclusion in the South Wheal Crofty case, that this is what had actually happened; and this view is to a great extent supported, I think, by reference to some experiments made by Mr. Abel, and recorded in his memoir above referred to. In some cases, using fulminate of mercury to explode fulminate of mercury in a tube 1 foot long and $1\frac{1}{4}$ inches in diameter, a small plug of tow, just sufficient to prevent the passage of daylight, prevented detonation. In another instance, using a tube 6 inches long and 1 inch in diameter, and applying fulminate of mercury to the detonation of some compressed gun-cotton, detonation was prevented by a plug of carded cotton wool. In another instance, using fulminate against fulminate, and in a longer (39-inch) tube, detonation was prevented by the insertion of "a diaphragm of thin bibulous paper," although the quantity of fulminate used to produce detonation was about five times that required of the same fulminate to transmit detonation under the same conditions, but with the omission of the paper diaphragm. Indeed, Mr. Abel found that even the degree of roughness or smoothness of the interior of the tube sensibly affected the velocity and force of the gas-wave by which detonation is transmitted. Even the existence of a slight air space between the charges has a most material influence upon the force of detonation; for Mr. Abel found, when employing charges of dynamite to transmit detonation to other charges of the same material, that while the detonation was transmitted through a continuous column, at a rate of from 19,000 to 21,000 feet per second, the same charges fired with an air space of only $\frac{1}{2}$ inch transmitted detonation with a velocity of only 6,239 feet per second, "or less than one-third of the lowest velocity observed in the experiments with "continuous trains of dynamite."

These observations bear, as it appears to me, very cogently upon my suggestion that the transmission of detonation may be totally arrested by the interposition of an inert body; and I venture also to claim to have reasonably established the possibility of the arrest of explosion, even in a continuous or approximately continuous column of explosive, when the initiative explosion has, through the use of a weak detonator, fallen short of the power necessary to constitute a detonation. If detonation or explosion may be localised or arrested by either one of these causes separately, still more does it follow that such a result would be possible when the two causes exist together. And it is easy to imagine a state of things in which the two causes would exist in combination. Thus, assuming a weak detonator (and in the production of many

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* I do not over-look the influence of the synchronism of vibration on the transmission of detonation; but, *cæteris paribus*, detonation resolves itself into a question of a blow.

† In the case of partially frozen dynamite, I have myself witnessed the failure of a detonation in a long column of the material (applied in the form of a sausage to a palissade) to extend all the whole column.

‡ The effect of a weak detonator would be further and sensibly diminished by the hole being greatly enlarged at the seat of detonation, because in that case the transmission of force downwards would be reduced. It is to be borne in mind that the upper parts of the holes in the present instance were considerably enlarged.

millions of these articles some occasional inequalities of charge are almost unavoidable),* it is only necessary to assume that the lower cartridges fit somewhat tightly, that in putting them into the hole the paper covering is more or less peeled back by the sides of the hole, and forms above the cartridge so stripped of its covering a plug or wad of inert material. Owing to the tight fit, perhaps the cartridge is not pressed to the bottom of the blast hole; and it may perhaps even be assumed that the succeeding cartridges do not find their way closely down on to the plug of paper which is lying at the top of those first inserted. Under these conditions, and having regard to the experiments recorded by Mr. Abel, and to his conclusions therefrom, can it be said to be impossible or even improbable that the bottom cartridge or cartridges (assuming that the condition suggested exists higher up the hole) should remain unexploded, even although the primer had gone off? Indeed, it is really scarcely necessary to assume the rucking up of the paper, for there would in all cases necessarily exist between the primer and the next cartridge, and between every two cartridges, the double folds of enclosing paper. My own decided belief is that such a result is an exceedingly probable one to occur under the conditions suggested; and I am further of opinion that cases of dynamite cartridges recovered unexploded from the bottoms of holes, of which the top parts have exploded, can only be accounted for in some such way as the above.

Possible presence of unexploded dynamite in a detached mass of débris.

Of course it is not impossible that a piece of dynamite may have remained unexploded in a piece of rock brought down by a former explosion, and lying unobserved among the debris.† But it appears much more probable that some unexploded dynamite had remained in No. 1. hole, for the following reasons:—In the first place, there is the undoubted fact that the charge of No. 1. hole had not produced the result anticipated; otherwise (as J. Craze admitted) it would certainly not have been necessary to bore another hole within ten inches of it. I have already referred to the statement of Cocks that the neighbourhood of the new hole was found to be very firm and unbroken, showing how little effect the charge of No. 1. hole (which was only ten inches from the new hole) had produced. Next, there is the undoubted fact, witnessed by Dr. Foster and myself, and others, that No. 1. hole had not blown away to the bottom. Further, it is certain that the explosion proceeded from, or from the immediate neighbourhood of, this hole. Also, the explosion, although serious enough as regards the two poor men killed, was really of a very local and feeble character, and such as might easily be produced by a single cartridge left in a hole.

Explanation of manner in which explosion of unexploded portion of a charge in an old hole by may be effected.

It remains only to consider in what way the explosion of any dynamite which may have been left in the hole could be brought about, seeing that the drill, although directed immediately over the hole, did not and could not reach to the part of it where the dynamite is assumed to have been left. As to this there is no difficulty. The old hole had, of course, become more or less filled with débris over the dynamite; this débris is broken rock, of intense hardness, such as no practical man in his senses would think of employing in tamping; and this, driven violently by a powerful percussion drill on to a cartridge of dynamite, or, it may be, on to some nitro-glycerine which had accumulated by exudation from the cartridge which had lain for many hours in the wet hole, would almost certainly and immediately cause an explosion.

Conclusion as to cause of accident.

On a review of all the circumstances, I arrive at the conclusion that the accident was caused in this manner; viz., by the drill operating immediately over some portion of the charge which had been left unexploded in the old hole No. 1.

Consideration as to blame attaching for the accident.

If this conclusion be correct,—indeed, whether it be correct or not,—it appears to me that the foreman, J. Craze, is decidedly to blame; 1st, for not having made a more thorough examination of the spot where the former blast had taken place before ordering a new hole to be drilled; 2nd, for having permitted the new hole to be proceeded with at the place originally assigned after he had discovered the existence of the old hole‡; 3rd, for not having made a stricter examination of the old hole, when he did discover it, to ascertain whether it contained any explosive or not.‡

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* Mr. W. Blanch Brain has informed me that in preparing his electric detonator fuzes he has come across several cases of detonators wholly empty, and some from which a portion of the charge has fallen out. And this occurrence became sufficiently frequent at one time even to render necessary the adoption of some special examination to ascertain, before fitting the detonators on to the fuze, that the former contained a proper charge.

† Curiously enough, an accident which has been traced distinctly to this cause occurred on the preceding day in the Festiniog tunnel, and caused the death of one man, and injury to four others. In this instance, a large boulder weighing several hundredweights, had become detached, and in this boulder were some unexploded charges of dynamite, one of which exploded when the men were engaged in breaking up or wedging open the boulder.

‡ See passage at p. 3 as to his denial, at the inquest, of his having discovered the existence of any part of the old hole before the explosion.

With regard to the latter point, I think the Diamond Rock Boring Company ought to institute a much more complete and regular system of searching for old holes and unexploded charges than they appear hitherto to have adopted. Indeed, there seems to have been no real system of search established; and although Craze endeavoured at the inquest to satisfy the jury that there was such a system, and that it was carried out by him, he certainly failed to carry conviction to my mind on this point. And the agent of the Company (Mr. Goffin), while stating that he had given general instructions on this head, did not venture to assert that there was any sufficient and satisfactory *system* of search established;—a circumstance which he, to some extent, excused by the statement that he had himself never before known of a case of dynamite left unexploded in a hole. But, whether or not it was the habit of Craze and others to search for unexploded dynamite after firing, it is quite certain that the duty was on this occasion very imperfectly and negligently performed. Whether we take Craze's statement as made to Dr. Foster and myself, or his totally different statement as made at the inquest, it is clear that he failed to search the spot carefully. If his former statement be accepted, it follows that, having so far searched as to find a portion of the old hole, he did not search further so as to ascertain that it was wholly free from dynamite. If we take the statement made by him at the inquest, the only conclusion to be drawn therefrom is that he really could not have searched the place at all; for, according to this statement, he failed not only to find any dynamite in the old hole, but he failed even to find any part of the old hole itself, though, as found by Dr. Foster and myself, portions of the old hole still existed, even after the accident. And finally, whether he searched or did not search, one thing is obvious; he did not so search as to bring to light this hidden danger. That unexploded dynamite was present at this spot the accident itself proves, and this unexploded dynamite Craze had failed to observe. A search which leaves sufficient dynamite, in the immediate vicinity of a place where a new hole is to be drilled, to kill two men and injure three others, is not worthy of the name; and, even taking Craze's own statements (whichever of them we select, and whether we believe or do not believe that he habitually searched after a blast), he is liable to the gravest censure. He either neglected what he admits to have been his duty altogether, or he performed it in so negligent and incomplete a manner as to fail to accomplish that for which the duty was imposed upon him,—the discovery of unexploded dynamite; and to this neglect on Craze's part this unhappy accident is, in my opinion, primarily attributable. Dr. Foster independently arrived at the same conclusion as myself as to the cause of the accident; and the coroner's jury accepted that conclusion as correct, because they appended to their verdict of "Accidental death" a recommendation that some thoroughly effective system of searching should be established and enforced.

To this Report I beg to append my opinion that it is not consistent with the safe carrying on of work of this description that the responsible foreman should be permitted to withdraw himself while it is in progress, as J. Craze did in this instance, and as E. Craze did when he was acting for his brother.

Finally, I take this opportunity of repeating a suggestion made by Major Ford in his Report on the Yarlside accidents, that for use in very wet places *waterproof* dynamite cartridges should be employed, as tending to minimize the evils resulting from the possible leaving of unexploded cartridges in wet holes.

I have the honour to be,
Sir,
Your obedient servant,
V. D. MAJENDIE,
Major R.A.,
H.M.'s Chief Inspector of Explosives.

The Right Hon. the Secretary of State,
Home Department.

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3.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending an Explosion of Dynamite, which occurred at the Deep Level Mine, at Halkyn, near Holywell, on the 9th January 1879;

BY

MAJOR A. FORD, R.A.,

H.M. INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, February 12, 1879.

I HAVE the honour to report that in obedience to your Order of the 29th ultimo, made under the 66th section of the Explosives Act, 1875, I have held an inquiry into the circumstances attending an explosion of dynamite which occurred at the Deep Level Mine at Halkyn, near Holywell, on the 9th January 1879. As the explosion took place between 10 and 11 p.m. and there was no one in the immediate neighbourhood it was happily unattended with any loss of life or personal injury.

In accordance with the provisions of the above-mentioned section of the Act I beg to render the following Report:—

Site of Accident.—The explosion occurred near the workshops of Messrs. Beaumont and Bicknell (formerly the Diamond Rock Boring Company, Limited), who are engaged in constructing a tunnel for the purpose of draining the lead mines in Halkyn Mountain in Flintshire. In this tunnel an accident, which formed the subject of a special Report,* occurred on the 10th April 1878, one man having lost his life, and 11 others having been more or less injured by the fumes of gun-cotton on that occasion. In the present instance the explosion was due to the thawing of dynamite, which was carried on above ground in some manure placed in the tunnel refuse.

The explosive component of dynamite is nitro-glycerine, which is absorbed by a porous infusorial earth known as kieselguhr† to form the dynamite. In its ordinary condition dynamite is a red homogeneous plastic mass, and is made into cartridges for use in blasting: when, however, the temperature falls below from 40° to 46° Fahrenheit the nitro-glycerine freezes, the cartridges then becoming quite hard. In this state they are unfit for use, and must be "thawed" or restored to their normal condition. This can only be effected by submitting the frozen dynamite to a higher temperature: if, however, on the one hand, this temperature is not much higher than the freezing point of the substance, the process is a very slow one;‡ and, on the other hand, if the temperature is too high, there is danger of an explosion taking place. What the actual temperature is to which dynamite must be submitted before it explodes depends to a great extent upon the mode in which the heat is applied, for nitro-glycerine begins to be decomposed at about 170° Fahrenheit. When the decomposition has once begun, heat is evolved, and the action is therefore liable to go on at an increasing rate; and under favourable conditions, *e.g.*, being in a confined space so that the gases generated

* Dated 28th June 1878.

† In the license to manufacture dynamite it is thus described: "Dynamite No. 1, consisting of not more "than 75 parts by weight of thoroughly purified nitro-glycerine uniformly mixed with 25 parts by weight of "an infusorial earth known as 'kieselguhr' and sufficiently absorbent in quality when mixed in the above "proportions to prevent exudation of nitro-glycerine." In Dynamite No. 2, charcoal and other substances are substituted for the kieselguhr. No. 1 was employed in this tunnel.

‡ Dynamite has been known to remain frozen in magazines for a long time after the temperature of the air outside has been quite warm, and that in the magazine considerably above the temperature at which the material originally became frozen.

[C.—2256.] *Price* ½*d.*

are unable to escape, and being surrounded by bad conductors of heat, an explosion may ensue comparatively soon. The exploding point of dynamite is given as 420° Fahrenheit by Nobel's Explosives Company, who manufacture it in this country; by others it has been fixed lower, viz., at 390° Fahrenheit: from 390° to 420° Fahrenheit, therefore, is the temperature to which the interior of the mass must be raised before it explodes. But it is clear that the heat externally applied to cause an explosion may, when the dynamite is confined and no sufficient vent is given for the escape of the gases, be far short of this temperature, for the heat resulting from the chemical decomposition established by the application of a moderate external heat may itself raise the interior to the exploding point. Indeed, it is quite probable that a long continued application of even the lowest temperature at which the nitro-glycerine begins to be decomposed (about 170° Fah.) would, under conditions favourable to the retention and accumulation of the heat generated by the decomposition, ultimately bring about an explosion.

Again, if dynamite which has been once raised to a temperature higher than that at which decomposition begins is subjected to a low temperature so as to be again frozen, the decomposition is for the time arrested; but on its being once more raised to about 170° Fahrenheit the interrupted decomposition is resumed, and would probably proceed more rapidly than if the substance had not been previously heated.

I think, therefore, that I may venture to assert that the actual temperature to be *applied* in order to fire dynamite depends, if upon no other circumstances, at least upon—

1. Whether the dynamite is confined or not, *i.e.*, whether the gases and the heat generated by the decomposition of the nitro-glycerine are prevented from escaping or not;
2. The rate at which the temperature is communicated to the dynamite, for if the heat be applied very rapidly, a higher external temperature will be necessary to produce explosion, as time is required for the decomposition of the interior;
3. Whether the dynamite has or has not been previously raised to the temperature at which decomposition is established;

and I may also assert that (4) unless the gases and the heat generated by the decomposition are permitted to escape, it may be expected to explode sooner or later, because the decomposition itself will ultimately raise the mass to the required temperature; and that (5) the direct application of a temperature variously stated at from 390° to 420° Fahrenheit will also bring about an explosion even when the dynamite is unconfined, excepting always the direct application of fire, which, it is well known, ignites the dynamite (when in small quantities and unfrozen), in which case the substance burns away before any part of it attains the explosion point.

It is evident, therefore, that any process of thawing dynamite which may by any possibility keep it at a temperature over about 170° Fahrenheit for any length of time must be dangerous unless the dynamite is unconfined, so that the internal heat can escape. The Nobel's Explosives Company recommend a "warmer" for the purpose, consisting of one tinned iron vessel which fits inside another, the outer one containing hot water, on the same principle as an ordinary glue pot. The dynamite to be thawed is placed in the inner vessel unconfined, and as the temperature (if it be not placed on a fire*) cannot reach 212° Fahrenheit, and under ordinary circumstances would not be higher than perhaps 150° to 170° Fahrenheit, this method appears open to no objection, and no accidents have as far as I am aware arisen from their use.† But these "warmers" are far from being universally adopted; indeed, in many mines, particularly those in which the work is done by contract, and the price of the dynamite is deducted from the amount paid to the men, the dynamite is generally issued from the store in a frozen state during the winter, and the workmen are left to render it fit for use by whatever means they may be able to adopt, no apparatus being provided for the purpose. Another difficulty also occurs in connexion with having the dynamite ready for use exactly when it is wanted, and if it be not then ready miners will adopt what appears to them the quickest method of preparing it, whether dangerous or not, rather than lose time while it is being thawed by a slower, though safer process. Numerous accidents

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* Some of the warmers issued by the Nobel's Explosives Company are covered with a non-conducting material, which serves a double purpose by retaining the heat and preventing the warmer being placed on a fire.

† The Special Committee on Gun-cotton, &c., appointed by the War Office in 1871, state in their Report that this warmer "appears to answer its purpose well, but the Committee think the water used should never exceed "a temperature of 130°; as a rough rule it should not be hotter than can be borne by the naked hand." Report, p. 91.

are the result. As an example, I may mention one which took place on the 21st December 1878, at Talargoch Mine, near Rhyl, where a man put a frozen cartridge into a tin which he placed over the flame of a candle to thaw it, while he sat down on a wheelbarrow about two yards off to eat his breakfast with his son aged seventeen. Shortly afterwards the dynamite exploded, killing the father on the spot and severely injuring the boy. And in the course of an inquiry into the circumstance I elicited from the boy that to thaw dynamite in this way was not an unusual method with his father; and it appeared that a warmer had been provided at the mine, but that it was rarely used except when larger quantities than one or two cartridges were required to be thawed.* In this case a single cartridge did all the mischief.

Circumstances of Accident.—In the Halkyn tunnel several holes are charged and fired at the same time, and it is necessary to have a considerable amount of dynamite ready thawed when required. For this purpose, three ordinary boxes, each holding 50 lbs., were placed in a heap of stable manure on some mine refuse, and the deficiency below 150 lbs., viz., the amount used during the past twenty-four hours, was made good every morning by fresh frozen dynamite from the store. When dynamite was required the banksman went and took it out from one of the boxes; whether the dynamite had been put in that morning or had remained over from the previous day was immaterial. In ordinary weather the dynamite took from eight to ten hours to thaw by the natural warmth of the manure. The 5-lb. packets were put into the boxes, ten into each, unopened, *i.e.*, tied up in the ordinary waterproof packing paper as issued by the Nobel's Explosives Company: the lids were then placed loosely on the boxes, which were covered up with the manure. It is important to notice that the waterproof paper was favourable to the retention of gases generated within; thus, in the event of decomposition taking place within one of the packages, the gases generated would not readily escape. During the recent very cold weather it was found that the heat of the manure was not sufficient to thaw dynamite placed in the boxes in the morning in time for use in the evening, and to increase the heat a pipe $1\frac{1}{2}$ inches in diameter was placed under the manure, through which steam from the boiler passed. The part embedded in the manure was bent into the form of the letter S, the boxes being placed between the folds and raised about 9 inches above the level of the pipe, the end of which extended about 2 yards beyond the manure heap. With the additional heat thus obtained, the dynamite was ready for use in about seven or eight hours; the temperature, therefore, of the manure heap could not even then have been very high, as so long a time appears to have been required to thaw the dynamite.

On the morning of the 9th January all the three boxes were found to be empty, and were filled up with frozen dynamite, and during the day 100 lbs. to 105 lbs. was taken out, 45 lbs. to 50 lbs. being thus left in the manure heap. About 11 p.m. a loud explosion took place, alarming the whole neighbourhood. Where the dynamite had been placed there was a crater about 12 feet long by 8 feet wide and 3 feet deep, and windows were broken within a radius of about 200 yards. The nearest buildings, viz., the office and engine-house, distant about 40 and 50 yards respectively, were screened by the mine refuse, which rose to a height of about 10 feet on either side of the manure heap, and to this protection the absence of structural damage may doubtless be attributed.

Cause of Accident.—There being no reason whatever to believe that this explosion was wilfully caused, it is clear that by some means or other in the process of thawing in the manure heap the internal temperature must have been brought to from 390° to 420° Fahrenheit, the exploding point of dynamite. This may have happened in one of two ways, viz., the abnormal heating of the manure heap, or the decomposition of the nitro-glycerine; or, as is more probable, by a combination of both.

When hay is not properly dried, the rick becomes heated, in some cases to such a temperature as to catch fire. The same heating occurs in manure, which is, however, generally very wet, and, as a rule, therefore, the temperature necessary even to char it is not often obtained. But I am informed† that although 212° Fahrenheit is a very unusual temperature, it appears that such a temperature may be reached in a manure heap; and in the present case the steam pipe passing under it no doubt partially dried the manure, and thus in all probability allowed a rise in temperature beyond that point. As soon, however, as about 170° Fahrenheit is reached in the interior, decomposition of the nitro-glycerine, as already stated, begins, the chemical action itself causing a still further

* Five persons were killed and two injured in recklessly thawing dynamite during the year 1878.

† For this information I am indebted to Dr. Dupré, F.R.S., who made inquiries for me with reference to this point.

K 671. Wt. B 1341.

rise in the internal temperature, unless the heat generated can escape; and if the internal temperature is then still further increased by a higher external temperature, what might under ordinary circumstances be a slow process becomes a rapid one. Increased temperature without intensifies the action within, still further augmenting the internal heat and action; and under those conditions the exploding point is soon reached. I think, therefore, that it may be justly said that had the temperature of the manure not been so high the decomposition would not have been so rapid, and the exploding point would probably not have been reached during the time the dynamite was allowed to remain in the heap. On the other hand, had the conditions not been favourable to the retention of the heat as it was generated the explosion would probably have been equally escaped. The two circumstances combined, however, to bring it about.

A somewhat similar accident occurred at Avonmouth, near Bristol, in the year 1874,* where dynamite was placed in a steam chest in which the steam was not under pressure. The heat *applied*, therefore, must have been much below the exploding point, and the decomposition of the nitro-glycerine supplied what was wanting in the external temperature. In this instance some of the dynamite had probably been reheated.

The conclusion to be derived from these accidents is that it is prudent to avoid any method of thawing dynamite which is liable to raise it to a temperature exceeding, or even approaching, that at which decomposition of the nitro-glycerine commences, viz., 170° Fahrenheit.

I have the honour to be,
Sir,
Your obedient Servant,
A. Ford, Major R.A.,
H.M.'s Inspector of Explosives.

The Right Hon.
The Secretary of State,
Home Department.

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* This case is referred to by Colonel Beaumont, M.P., in his evidence before the Parliamentary Committee on Explosive Substances in 1874. *See* Q. 1408, p. 106.

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4.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending the Destruction by Lightning of a Gunpowder Store at Victoria Colliery, Bruntcliffe, on the 6th August 1878;

BY

VIVIAN DERING MAJENDIE, Major, Royal Artillery,

HER MAJESTY'S CHIEF INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

Sir, Home Office, 17th September 1878.

I have the honour to furnish the following report on the circumstances attending the destruction by lightning on the 6th August 1878, of a gunpowder store at the Victoria Colliery, Bruntcliffe, Yorkshire, occupied by Messrs. Haigh & Sons, by which two persons sustained injury.

The first notice I received of this accident was a paragraph which appeared in the newspapers of the 8th August. I at once placed myself into communication with the occupiers of the store, calling their attention to the provisions of Sec. 63 of the Explosives Act, 1875, (which requires accidents of this description to be reported to the Secretary of State) and with Captain Stuart Russell, Chief Constable of the West Riding. Messrs. Haigh's omission to furnish the required report was, they state, entirely an oversight on their part, which they have since rectified, and I have no doubt this explanation is correct, especially as they had promptly made a report of the accident to the Inspector of Mines as required by the Mines Act. Messrs. Haigh have since the occurrence afforded me all the assistance and information in their power; and I have to acknowledge also the very great assistance which I have obtained from Captain Stuart Russell, who was good enough to visit the scene of the accident and to make personal enquiries into several of the points as to which I desired information.

Circumstances under which accident occurred.

The accident occurred at about half past four p.m. on the 6th August, during a violent thunderstorm which was raging over the district, and when the storm appeared to be locally at its height. That the accident was due to lightning seems to admit of no doubt. The store stood by itself, at a considerable distance from roads, dwelling-houses, workshops, &c.; it contained, according to Messrs. Haigh's positive statement, nothing but gunpowder, an explosive which is beyond all suspicion of possible spontaneous ignition; no one was in or near the store at the time; the door was locked, and there was no aperture in the walls, or between the walls and the door; and as the explosion was coincident with a vivid flash of lightning, and other injury was done in the neighbourhood by lightning at the same time, the accident may be unquestionably accepted as having been caused by lightning.

This being the case, the points which it is of interest to note are 1st, the situation and construction of the store; 2nd, the nature and amount of damage caused by the explosion; 3rd, the lessons apparently to be derived from the accident.

1st. *The Situation and Construction of the Store.*

Situation and construction of store.

The store was duly licensed under a store license (for gunpowder only) Division D. granted under the Explosives Act, 1875, by the justices of the Dewsbury Petty Session (being the local authority for the district) on the 15th March 1878. The store had been built in 1876 to satisfy the requirements of the Explosives Act, and had been licensed in that year, but the license having been allowed to run out* the store was

* Sec. 18 requires a store license to be annually renewed.

re-licensed on the date named. I am unable to state positively if this store was situated the full distance from protected works assigned for a store of Division D. (see Order in Council, No. 5), but Messrs. Haigh express their belief that it was so situated, and I think this may be taken to be the case, 1st. Because the store had been specially built in 1876 to replace one which was too near "protected works"; 2nd. Because the justices are not authorized by the Act to license a store under a division which is not situated as the Act requires (sec. 15); 3rd. Because the place had been frequently visited by the Superintendent of Police appointed to act as officer of the local authority under the Act, and it would have been his duty to note any failure of compliance with the statutory provisions; 4th. Because the plans and list of distances with which I have been furnished show no protected works within the statutory radius for stores of Division D. At any rate, whether the distances were or were not in every particular fully observed, it is quite certain that all the main distances were more than observed. The nearest dwelling houses appear to have been about 300 yards distant,* there is no church or school within about the same distance, the colliery buildings are about 280 yards from the store, and Messrs. Haigh state that the nearest workshop was distant 220 yards; there appears to have been no highway within about 300 yards; and the nearest railway (a private mineral siding) is 125 yards distant. All these distances, it will be observed, are considerably over those assigned for stores of Division D. The buildings were all situated to the S.E., E. and N.E. of the store. In all other directions there were large open fields, and the distances for protected works were much more considerable than those above quoted. The ground afforded some slight protection to the N.E.

The construction of the store was as follows:—

It was an oblong brick building with brick arched roof, length 9 feet, width 5 feet, height 6 feet (internal dimensions). The store had a uniform thickness of three bricks. It was furnished at one end with an iron door, at the other end it was provided with a lightning conductor. The lightning conductor consisted of a copper wire rope, 10 gauge copper wire, the rope being $\frac{7}{16}$ inch thick, having four points at the top (one large one in the centre, and three smaller ones round it), it extended to about 13 feet above the top of the building, and about the same length was carried into the ground and terminated in a drain. It had been erected in 1876, by Mr. John Bisby of Leeds. The conductor was fixed to a pole distant about 2 inches from the end of the building opposite to that in which the iron door was fixed. It was not connected with the iron door in any way.

At the time of the accident the store contained 20 "whole" barrels of gunpowder (of 100 lbs. each) = 2,000 lbs., and another barrel with a few pounds in it, or in round numbers about a ton of powder.† The store contained no other explosive or stores of any description.

2nd. *The Nature and Amount of Damage caused by the Explosion.*

Nature and amount of damage.

Fortunately the personal injury caused by the accident was very slight, being limited to injury to two little girls, one of whom had her thigh broken, and the other was wounded in the leg and head by projected debris. These children were 320 yards from the store at the time of the accident. It was at first thought that a third person had sustained injury, viz., a young man who was working on the pit hill about 350 yards off, and whose leg was fractured almost at the same moment, it was supposed by a projected brick, but it is now believed that his injury was occasioned by his being struck by lightning just before the explosion of the magazine. Fortunately heavy rain was falling at the time and thus the number of persons walking about in the neighbourhood of the store was very much less than it would otherwise have been. Had many people been exposed to the projected bricks and debris, the consequences might have been very much more serious.

Structural injury.

The only structural damage effected was produced by the impingement of bricks, which striking with great force had in a few instances, partially penetrated or displaced brick work in the dwelling-houses and buildings, and a portion of the iron of an iron church was broken by a piece of projected debris. A brick was driven through a window in one of the houses at three hundred yards and broke a bedstead. So far as

* The plan furnished by Messrs. Haigh shows the nearest dwelling houses at 325 yards; and in a letter (dated 10th August) they state they were "over 300 yards." The chief constable, however, gives the nearest dwelling-house at 280 yards (letter of 30th August) so "about 300 yards" is a fair statement of the distance.

† In the gunpowder trade 2,000 lbs. of gunpowder are reckoned as one ton.

I have been able to discover no other structural injury was occasioned. Even the workshop at 220 yards and the colliery buildings at 280 yards sustained no structural injury beyond the slight injury effected, as above described, by the debris, which was hurled with great violence in all directions.

Minor injury.

But a large quantity of windows (between 200 and 300) were broken, some by the concussion, some by the flying debris, standing oats over an area of about an acre were destroyed, and standing barley over an area of about half an acre. The chief constable states that the grass field between the cottages and the magazine was "ploughed up in "all directions by bricks, one piece of stone weighing I should say nearly 1 cwt. had "been projected to a distance of 150 yards, a stone of a wall distant about 300 yards in "the opposite direction to the row of cottages had been struck with such force as to "be driven in several inches.*

3rd. The Lessons apparently to be derived from the Accident.

Lessons to be derived from the accident. As to the application of lightning conductors.

This accident appears to suggest several conclusions:—

(*a*) In the first place, it appears to me to afford a striking confirmation of the principle which has been repeatedly and emphatically enunciated by Sir Wm. Snow Harris and other authorities on the subject of lightning conductors, that in order to secure an efficient protection for a given building, all the metal of the building, and as far as possible the whole of the structure itself should be brought into actual connexion with the system of conduction, in other words, that the general conducting power of the mass of the edifice should be completed and all attractive and prominent parts allied in one protective combination so as to "bring the whole" (as it has been expressed by Sir Wm. Snow Harris) "as nearly as may be into that passive or non-resisting state which "it would assume, supposing the whole were a mass of metal."† In the present case, assuming the conductor itself to have been efficient, a point which there seems no sufficient reason for doubting,‡ the system of conduction were obviously defective. Not only was the whole length of the building left unprotected, the conductor having been on a pole at one end and carefully insulated from the building, but the iron door which was at the opposite end was absolutely unconnected therewith and was not itself supplied with any earth connection.

It appears clear, therefore, that even what may be deemed *per se* an efficient lightning conductor, *i.e.*, a conductor, which considered alone, offers a path of little or no resistance even to a powerful electric current, does not afford a reliable protection to a building unless it be scientifically applied, and with due regard to those principles upon which the more eminent authorities on electrical science are agreed. To a disregard of these principles, especially in respect of the iron door being left out of the system of conduction, and unconnected therewith, I believe the present accident may be attributed.

As to the construction of stores.

(*b.*) In the second place, this accident suggests some observations with regard to the construction of places of storage of explosive, not new observations perhaps, but observations which may be profitably repeated in the light of this further experience. It will have been observed that the main effects were what may be called projectile effects, having been produced by the impingement of projected bricks and debris. That the construction of the store was favourable to such a result cannot be doubted. The building itself was three bricks thick throughout, and furnished with a stout three-brick arched roof. In other words, it was what is commonly called a bomb-proof brick building. An explosion occurring inside a building of this description is not only more formidable on account of the superior intensity of the force generated under such strong confinement, but the construction of the building itself readily furnishes the projectile matter through which that force acquires its most formidable expression. In other words, a more powerful explosion results from the stout construction and resistance of the building in which it occurs, while the materials of which the building is composed

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* Letter from Captain Stuart Russell, 10th August 1878.

† *Lightning Conductors*, by the late Sir Wm. Snow Harris.

"All the metal in the roofs and other parts of the building of whatever kind should, so far as possible, have "metallic communication with the main conductors."—*Ibid.*

"To detach or insulate the conductors is to run away from our own principle, which is, that the conductor "is the channel of communication with the ground in which the electrical discharge will move in preference "to any other course. To detach or insulate the conductor is to provide for a contingency at once subversive "of our principle."—*Ibid.*

"Iron shields in casemated works must be placed in connexion with the conductors."—*Army Circular*, 1st May 1875.

‡ I am not entirely satisfied that the earth connexion was all that could be desired, though the conductor is said to have been carried about one foot deep, and then extended laterally 12 to 15 feet, the ends of the wires being opened out and buried from three to four feet deep. It is doubtful if the ground was damp enough.

become available to inflict injury of serious character at long distances. These conclusions suggest that as a general rule, the bomb-proof construction is one which it is not advisable to adopt for stores of this description. It is, of course, essential that the construction should be of such strength and character as will afford reasonable security against attack or unlawful interference*; but for this purpose it is not necessary to resort to what is known as the bomb-proof construction, which, indeed, however suitable in certain circumstances, as, for example, in some military magazines, or in the magazines of powder factories which may be within the range of possible destructive effect of some of the working powder buildings, is not only unnecessary, but, as I have shown, may be positively hurtful. I am of opinion that walls of reasonable strength, with a tiled or slated (not brick-arched) roof, wood-lined throughout, and with a surrounding fence, afford the most suitable combination for a colliery store or magazine, except where an underground or half-sunken magazine can be produced. A magazine so constructed not only affords a line of least resistance in the event of an explosion in the interior in a direction where the explosive effects are least likely to be formidable, viz., upwards, but the amount of available debris or projectile matter is reduced to a minimum. The results are also likely to be further controlled by the employment of brick instead of stone, and by the magazine being surrounded by an earth mound.

In any case, the advantages to be derived in the case of a colliery magazine or store from the employment of the bomb-proof construction, are not commensurate with the serious disadvantages which the present accident shows may attend its adoption.

As to distances to be observed between stores and protected works.

(*c.*) Lastly, it is worth while to notice that the results of this accident do not appear to warrant any disturbance of the distances laid down in the Order in Council as those to be observed between stores and the various protected works. In the present instance the quantity of powder exploded was almost exactly 2,000 lbs., and this amount may be kept in a store of Division C. For a store of Division C. the distance from protected works of Class 1 is 75 yards, and for protected works of Class 2, 150 yards (Order in Council, No. 5); owing to the store having been over these distances from all protected works, the accident affords no measure of effects which might be produced within the above radii; and beyond these distances the effects actually produced were not such as it would be reasonably practicable to provide against.

The object with which a safety zone is assigned in the case of stores and magazines may be stated roughly to be to provide against serious structural injury resulting in the case of an explosion. It was never proposed to authorize the building of stores and magazines only in places where if an explosion occurred not even a pane of glass would be broken and no visible effects on persons or things would be produced. A little reflection will show that to impose such a condition would practically almost amount to the total prohibition of stores and magazines. In the case of all explosions, windows are liable to be broken at considerable distances. For instance, in the case of the Regent's Park Explosion of 1874, the five tons of gunpowder which exploded broke windows up to one mile,† while in the present instance the explosion of one ton caused the breakage of numerous windows at from 300 to 400 yards. But it is obviously impracticable to lay down that the storage of five tons of gunpowder shall be prohibited except where a clear radius in all directions of not less than a mile can be obtained, or that for one ton something like a quarter of a mile should be insisted upon.

The extreme distances to which bricks and other debris may be projected and at which they may occasion injury can, obviously, for similar reasons, not be adopted as a measure of the safety zone to be adopted. In other words, the establishment of stores and magazines cannot be made absolutely safe. Some risk must always attend them, and seeing that such places are vital to the national industries, it is necessary that this risk should be incurred. But the public have a right to demand that magazines and stores shall not be allowed to be erected where an explosion would blow their houses about their ears, or inflict material structural injury, nor where an accident would be likely to be attended with fatal consequences to large numbers of persons on a highway or other place of public resort.

The zone which is laid down as that to be observed in the case of stores is calculated on this basis; and there is nothing in the present accident to disturb that calculation, for within this zone no injury as it happened was effected, owing to the absence therein of protected works, while such injury as was inflicted beyond the assigned zone was of a character against which, in my judgment, and having regard to the admitted

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* Instances are not infrequent within my experience of lightly constructed outlying magazines being entered at night for the purpose of stealing powder.

† In that case it must also be borne in mind that the effects were considerably controlled and probably largely modified as to lateral damage by the high banks of the canal.

necessity for the existence of places of deposit for gunpowder and other explosives, it is impracticable to guard.

In conclusion, I may state that section 64 of the Explosives Act, 1875, requires the permission of the Secretary of State to be obtained for the construction or renewed use of a magazine or store which has been wholly or partly destroyed by an explosion or fire therein, and in accordance with this section, Messrs. Haigh and Sons applied for the requisite permission to reconstruct the store which forms the subject of this Report. This was the first case since the Act came into force in which a *store* (as distinguished from a magazine) has been wholly or partly destroyed by explosion, and it was necessary to consider on what principle this permission should be granted or refused. After very careful consideration I came to the conclusion that it was desirable I should recommend that when a store under license,* is, as in the present instance, wholly destroyed, permission to reconstruct it under the section above referred to, should not be given, but that the applicant should be required to apply to the local authority for a new license, for the old or some other site. If the store was not situated as the Act requires a new license for the old site would of course not be granted by the local authority, and it would be undesirable in that case that an illegality should be continued by the *quasi* authority of the Secretary of State; if the store was situated as the Act requires the license would be granted as a matter of course (section 15), in which case the Secretary of State's authority would be superfluous; and it seemed to me that by thus leaving the legality of the site and store to be determined by the local authority, a sounder course is adopted than if the Secretary of State were to interfere. It may be said that the object of this section is to enable the Secretary of State to review all the circumstances and to decide whether or not the site is suitable for the re-erection of the store or magazine. In the case of a magazine† this is true, and it would be proper that the circumstances should be all thus reviewed because the distances assigned for a magazine vary in each instance, and are not fixed by statute but by license. But in the case of a licensed store it is otherwise. The distances are fixed by statute; and if the site is not deemed a suitable one for the re-erection of a particular store, it would follow that the sites assigned by statute for all similar stores would have to be condemned. In other words, while each case of an exploded magazine ought to be considered on its merits, in the same way as the details for each application for a magazine license are separately considered, the cases of exploded stores can only be properly considered *en masse* and with reference to the statutory conditions affecting all stores. If those statutory conditions are deemed on a review of all the circumstances to be unsatisfactory, they can be altered, but it would be illogical to apply this alteration to the disadvantage of one particular store. Accordingly, I am of opinion that while the surrounding circumstances of any such explosion as the present should be strictly reviewed, in order to determine if the statutory conditions affecting stores generally call for alteration, and that every lesson which the accident is capable of affording may be deduced therefrom, the question of the re-erection of any particular store should be determined solely by the considerations which would affect the erection of any new store on a given site; and that the applicant should be left to obtain or be refused a new license, according as the site is or is not one for which such license can be lawfully claimed.‡ This course has been followed in the present instance.

As to re-erection of exploded stores.

I have, &c.

V. D. Majendie, Major R.A.,
H.M.'s Chief Inspector of Explosives.

The Right Hon. the Secretary of State,
Home Department.

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* The question of stores under continuing certificates (section 20) is not dealt with here, the considerations affecting their re-erection being of a different character.

† Perhaps also in the case of a store under continuing certificate. But see preceding footnote.

‡ See footnote next but one above.

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REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending an Explosion which occurred in the Detonator Factory of the Cotton Powder Company (Limited), at Uplees Marshes, near Faversham, on the 16th May 1879;

BY

MAJOR A. FORD, R.A.,

H.M. INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, 23rd June 1879.

I HAVE the honour to report that in obedience to your Order of the 28th ultimo, made under the 66th section of the Explosives Act, 1875, I have held an inquiry into the circumstances attending an explosion which occurred in the Detonator Factory of the Cotton Powder Company (Limited), at Uplees Marshes, near Faversham, on the 16th May 1879, by which one man was killed.

In accordance with the provisions of the above-mentioned section of the Act I beg to render the following Report:—

Factory in which the Explosion occurred.—The factory in which the explosion occurred was originally established for the manufacture of tonite or cotton powder, but in 1877 the Company, by means of an Amending License,* obtained permission to erect some additional buildings in which to carry on the manufacture of the detonators used to fire the tonite. In one of the buildings thus authorised to be added, an explosion, in which a man and a boy sustained serious injury, occurred on the 12th February 1878;† and subsequently alterations were made by means of another Amending License‡ in order to minimize the risk attending a dangerous part of the manufacture, viz., the pressing of the detonating composition into the empty capsules or shells, in connexion with which operation the former accident as well as that to which the present Report relates happened.

Method of Manufacture of the Detonators.—A detonator may be described as a very large and powerful percussion cap, and the processes of manufacture are on much the same principle. The empty shells or capsules are put into a frame or "jig" of ebonite with a metal base, containing 100 holes, into each of which one shell fits, the open ends being upwards; and the composition, $2\frac{3}{4}$ ounces to the hundred detonators, is inserted, as in making caps. The jig with the charged shells is then removed to another building, where by means of a wheel 100 plungers are brought in one operation into the open detonators, pressing the composition into them with considerable force. An explosion of the very sensitive composition§ employed, may, in this operation, very naturally be occasionally expected; and in order to protect the workman from its effects he is placed behind a wooden partition in the building in which the operation is carried on while working the wheel which puts on the pressure. This is an admirable arrangement; and if there be present in the building no explosive, other than the composition in the detonators under pressure, it is difficult to see how an explosion in the press can cause injury to the man so long as he stands thus under cover. A good illustration of the advantage of this arrangement is afforded by an explosion which took place during this operation on the 1st ult., when the press was blown to pieces, but the man, sheltered by the partition, was uninjured. As soon as the requisite force has been applied, the workman, still standing behind the screen, takes off the pressure; he then goes to the press and removes the jig containing the

* No. 29, dated 15th May 1877.
† Special inquiry by Major Majendie. Report, dated 6th March 1878.
‡ No. 56, dated 12th August 1878.
§ The composition consists of fulminate of mercury, chlorate of potash, and gun-cotton.

[C.—2380.] *Price* 1*d.*

hundred pressed detonators. Holding the jig in his two hands he turns it upside down over a sieve which rests on a bucket containing water, in order that the detonators may fall out and be retained in the sieve, while any loose composition which may fall from the jig will pass through the sieve into the water. The detonators are then put into a box, with sawdust, for removal to the packing house, the box being placed into a small cupboard with two doors opening inwards on hinges,* one on the inside and the other on the outside of the building. An attendant can thus take away the finished detonators without entering the press house.† The total amount of composition allowed at any one time in the building by the license is two pounds, whether or not contained in detonators;‡ and the actual limit appears to have been only the charge contained in 100 detonators (viz. $2\frac{3}{4}$ oz.), besides that in finished detonators in the cupboard, and such as might be adhering to the sieve or have fallen into the water in the bucket, as no more than one jig was allowed to be brought into the building at a time. One man only, William Coulton Amos, aged 40, was employed in filling and pressing the detonators.

Circumstances of Explosion.—About 9.45 a.m. on the 16th May, Amos was alone in the press house, and the only other person in that part of the factory was Emma Franklin, who was at work in the packing house. Another man, Walter Frederick Smith, employed there, but not in the danger buildings, had gone to fetch some sawdust at the time. Amos had pressed two lots of detonators which he had placed in a box into the cupboard ready for removal, and was engaged at a third lot when an explosion occurred. Emma Franklin heard the report, like, as she said, the discharge of a gun, and on going to the building from the packing house saw Amos lying on the floor near to where the bucket of water with the sieve resting on it had stood. He appeared to be dead. The assistant foreman, Henry Chowler, was soon on the spot from the other part of the factory, but Amos never rallied; in fact, he seems to have been killed instantaneously by a piece of the metal base of the jig which struck him in the chest.

The manufacture of detonators was carried on in three sheds, viz., the filling shed, the pressing shed, and the packing shed. The filling shed is divided into two compartments, in one of which the empty shells were put into the jigs by Emma Franklin, and in the other the composition was inserted into the shells by Amos. When two jigs were thus prepared Amos took them, one at a time, to the press house, and Franklin went to the other building to pack the finished detonators. The work in the detonator sheds was in the charge of Amos, who appears to have been a steady well conducted man; but both the foreman, George Trench, and the assistant foreman, Henry Chowler, were in the habit of visiting that part of the factory from time to time to see that all was going on right. On the morning of the 16th May, the day of the accident, Chowler went there between 7 and 8 o'clock, and saw that Amos had on his proper working clothes, and that the pressing machine was in good order. In the filling shed he had a conversation with Amos (which Emma Franklin overheard in the other compartment) telling him that there had been an accident at a factory in Scotland, where a girl had been blown to pieces with detonators,§ and he reminded him that he should be very careful and sponge away any loose fulminate which might be under the jig in the press.

When Chowler had gone, Amos remarked to Franklin that he "hoped he should not "have his head blown off," and he appeared to her to be in a nervous state. At half-past 8 she went away to breakfast, leaving Amos and Smith at the sheds. Amos was then going to press some detonators. On returning a little after 9 she went to the packing house, where she was engaged until the accident happened.

Effects of Explosion.—I received a report of the circumstance the same evening and visited the place the next day. The contents of the shed did not appear to have been disturbed,

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* One object of this arrangement is to prevent communicated explosion by ensuring the doors not being left accidentally open, as they close themselves by their own weight. It will be seen that 200 detonators in this "trap" cupboard did not explode on the present occasion.

† This is another advantage of the arrangement.

‡ Filling as well as pressing detonators is permitted in this building, provided the person engaged in that operation is screened from the other workpeople. The provision in the license on that point is, "the work-"people to be so disposed and protected by screens or otherwise as to afford to each workperson good and "sufficient security against the effects of an explosion in connection with any other operation than that on "which he is himself engaged." Formerly the detonators were filled and pressed by hand singly, and since the introduction of the machine by which 100 can be pressed in one operation, the filling has been done in a separate building.

§ This accident occurred at West Quarter Factory, near Polmont, on the 12th May 1879. See Report by Major Majendie, R.A., dated 24th May 1879.

except that the body of the deceased had been removed from the compartment containing the press to that behind the screen, and I carefully examined the building. On the north side of the exterior four of the planks of which it is constructed had been pushed out a little at one end, just below the cupboard before mentioned, one of these only being split. There had been no explosion of finished detonators in the cupboard. On the south side a window, inside which the press was standing, had all the panes of glass broken, and the frame of the window was slightly displaced; another window behind the screen had four panes of glass only broken. The east and west sides, in each of which there is a door, were uninjured. The dimensions of the building are about 9 feet by 6 feet. In the interior the screen of wood divides it into two equal compartments, an open doorway between the two doors of the building leading from one to the other. The floor, which was covered with black calico or linen, was strewn with small pieces of broken glass from the window and of ebonite from the jig, among which I found fragments of the sieve and of the bucket which had been blown to pieces, and portions apparently of the two thumbs of the deceased. The press was uninjured, as was also a bucket containing sawdust standing near the place where the water bucket had stood, which was marked by the bottom of the bucket remaining there and by some unexploded fulminate lying round it on the calico, doubtless contained in the water in the bucket and spilt when the bucket was blown to pieces. The brass base of the jig, about a quarter of an inch thick, was in two parts, one, stained with blood, having struck the deceased in the chest. There was a black mark, such as would have been caused by an explosion of fulminate just above where the bucket had stood, and by which the planks had been loosened as observed from the exterior; and there was no mark whatever of any other explosion in the building.

I noticed that the cleats or handle pieces which had been put on to the water bucket to allow a rope handle to be substituted for a metal one, had been fastened on with iron nails, contrary to the provisions of the Act affecting the factory.

Cause of Explosion.—From the examination of the building and its contents, it was abundantly clear that the explosion had taken place just over the bucket with the sieve standing on it, and that a considerable number of detonators were still in the jig at the time as the metal base of the jig was broken into two pieces and the ebonite was blown into small fragments; also from the condition of the sieve and of the bucket it was clear either that there must have been some detonators, or which is not very probable, a large amount of composition, in the sieve; hence, as no other explosion had taken place in the building, the natural conclusion was that Amos had brought about the explosion in some way when in the act of upsetting the detonators from the jig into the sieve.

Further inquiries, and the evidence of the assistant foreman, Henry Chowler, who was the first to enter the shed after the accident, all tended to confirm this view. Thus injuries which the deceased received in his chest from the piece of the metal base of the jig, and in his legs, show that he was stooping down over the bucket at the time, while the loss of his thumbs and of fingers on both hands proves that he was actually holding the jig, and that it had not dropped from his hands; indentations on the metal base show that more than one-half of the detonators were in the jig when it occurred. Again the magazine boots worn by the deceased were nearly new, and there was not the slightest mark on the soles such as would have been the case had the explosion originated by his treading on grit or on a match which might have been accidentally brought into the shed.

And it is not unreasonable to suppose that an accident might have been thus caused, for when the extreme sensitiveness of the composition (in which, indeed, its great value consists) is considered, the wonder is that any part of the manufacture of detonators can be carried on without more or less frequent accidents. Moderate friction or percussion is sufficient to explode it, such as would be caused, for instance, by the detonators falling on loose composition on the wire sieve over the bucket, or by Amos striking composition on the rim of the sieve with the jig, which weighed little short of 6 lbs. I have no doubt that in the present instance the explosion originated in one or other of these two ways, and on the whole I am inclined to give the preference to the latter as the more probable cause, seeing that so few of the detonators had actually fallen out of the jig, which could not therefore have been more than partially turned over.*

* The foreman and assistant foreman had both worked in the press house, and they assured me that when a jig containing filled detonators was turned over after pressing, at least 90 out of the 100 would fall out readily. As the work was suspended at the time of my inquiry I had no opportunity of trying filled detonators, but I found that it was the case with empty ones. These, however, would naturally fit somewhat less tightly in the jig than filled detonators.

Conclusion as to Cause.—I am thus led to the conclusion that the explosion was brought about by Amos striking the rim of the sieve, on which there was doubtless some composition from detonators pressed the same morning, with the jig when turning it over; but, whether it was so caused or by the falling of the detonators into the sieve, the occurrence appears to have been purely accidental.

Coroner's Inquest and Verdict of the Jury.—I attended the inquest on the deceased, which was held at the factory on the 19th ultimo by Mr. Harris, the Coroner, and explained to the jury how, in my opinion, the accident had happened, and they returned a verdict of "Accidental death."

Irregularities brought to light.—In addition to the iron screws in the bucket already referred to, another irregularity was brought to light in the course of my inquiry as follows; Amos, who was required by the special rules made by the proprietors, and sanctioned by the Secretary of State, to change his ordinary clothes before going into a danger building for the working clothes without pockets provided by the Company, had put on his working clothes over his own waistcoat and trousers on the morning when he met with his death, and had actually taken a bunch of keys in one of his pockets into the shed. Articles of iron or steel are in such a building eminently dangerous and expressly prohibited; it is not too much to say that a bunch of keys falling on loose fulminate on the floor could scarcely fail to cause it to explode. There are, it is true, certain risks which attach themselves to such a manufacture and can never be wholly eliminated, but here was one well understood and recognized, and provided against by a special rule, a breach of which would subject the offender to a penalty. Yet we find Amos, who had heard that morning of an accident in another factory and whose nerves appears to have been affected, and who had expressed himself to the effect that he "hoped he should not have his head blown off," nevertheless carrying with him into the shed this special element of danger and contravening a law made for his safety. The assistant foreman looked to see that he had on his proper clothes, but failed to notice that his ordinary clothes were underneath, a neglectful mode of making his examination which calls for censure. As well as a bunch of keys the man might have had other dangereous articles (such as matches) in his pockets, perhaps without being aware of their being there.*

I do not, however, think that there are grounds for believing that either the iron screws in the bucket or the pockets worn by Amos contributed in this case to bring about the explosion, but there should be such a system of supervision in the factory as would render similar irregularities impossible, and I have no doubt that the Cotton Powder Company will do everything in their power to secure this for the future now that their attention has been expressly directed to the point.

I must not omit to notice that much has been done by the Company to minimize the effect of accidents since the explosion on the 12th February 1878. It must be recognised that accidents in such a trade are not entirely preventible, and that there will always be a certain amount of risk in handling a substance possessed of so delicate and sensitive a character.† I am bound to say that the arrangement by which the operator stands behind a screen while the pressure is applied to the detonators, and which is indeed the most dangerous part of the manufacture as carried on in this factory, leaves little to be desired; as, in fact, was proved by the explosion in the same building on the 1st May last when the press was practically destroyed and the man was uninjured: again, the plan of putting the finished detonators in a box into a cupboard, the doors of which must remain closed, and allowing only $2\frac{3}{4}$ oz. of composition inside the building is very commendable; and I think it is not unreasonable to suppose that had the portion of the metal base of the jig struck Amos in a less vital part than the chest, his injuries would not necessarily have been fatal. No doubt now that the attention of the Company has been so pointedly drawn to the danger of allowing the detonators to fall on one another in a wire sieve, and of the chance of an explosion occurring by the striking of the rim of the sieve with the jig, they will introduce the necessary modification into this part of the work also.

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* Several instances have occurred in which persons in danger buildings have been found at an inspection to have matches in their pockets contrary to their knowledge and belief.

† For example, "very moderate friction or percussion will cause fulminate of mercury to detonate violently, "so that it must be kept in a corked bottle lest it should be exploded between the neck and the stopper." Bloxam's Chemistry, p. 445. "When fulminate of mercury is used even this method is too rough [viz., "mixing the ingredients by brushing them through a hair sieve], and the ingredients are mixed by a man "using a fine badger's hair brush, all proper precautions being taken to guard against explosions."—Treatise on Ammunition, Royal Laboratory, Woolwich, 1877, p. 20.

As it appears, therefore, that the accident was not to be attributed to any breach of the regulations, but was rather due to the risky character of the operation in which Amos was engaged, and to the non-elimination of certain dangers which this accident itself has disclosed, I do not think that in this instance there is any special ground for complaint against the Cotton Powder Company. The exceptionally dangerous nature of this work had perhaps not been fully recognised by them; but the great improvements which have been introduced into the manufacture, consequent on the recommendations made by Major Majendie after the former explosion, justify the expectation that with the increased experience now gained there will be no failure on the part of the Company to prevent, as far as possible, a recurrence of the disaster.

I have the honour to be,
Sir,
Your obedient Servant,
A. Ford, Major R.A.,
H.M.'s Inspector of Explosives.

The Right Hon.
The Secretary of State,
Home Department.

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REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending an Accident which occurred in the Detonator Factory of Nobel's Explosives Company (Limited), at Redding, West Quarter, near Falkirk, on the 12th May 1879;

BY

MAJOR V. D. MAJENDIE, R.A.,

H.M. CHIEF INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, 24th May 1879.

I HAVE the honour to report that in obedience to your Order made under the 66th Section of the Explosives Act, 1875, I have held an inquiry into the circumstances attending an accident which occurred in the detonator factory of Nobel's Explosives Company (Limited), at Redding, West Quarter, near Falkirk, on the 12th May 1879, by which a young woman (Sarah Jane Boyd, aged about 18) was killed.

In accordance with the provisions of the above-mentioned section of the Act, I beg to furnish the following Report.

Position and distribution of factory.

The factory in which the accident occurred is situated about a mile from Polmont junction on the North British Railway, and consists of six wooden worksheds, a factory magazine, and a room for the workpeople to change their clothes in. The worksheds, which are about 20 yards apart, and between which and the magazine there intervenes a distance of about 100 yards, are all (except the packing house) screened from one another by substantial earth mounds, and are connected with each other and with the factory magazine in the one direction, and the changing room in the other, by means of wooden platforms. The factory is separated by a fence from a group of buildings also occupied by Nobel's Explosives Company (Limited), and used for the manufacture of chemicals, and as offices and store rooms. This group of buildings is not subject to the Explosives Act.

Working arrangements of factory.

The detonator factory is carried on in virtue of a Continuing Certificate granted under the Explosives Act (No. 18, dated 11th April 1876), and three Amending Licenses (No. 35, dated 5th September 1877, No. 62, dated 7th October 1878, and No. 69, dated 28th November 1878). The present authorised uses of the several buildings are assigned by a schedule to the last of these Amending Licenses, and by this schedule two of the sheds designated "filling sheds" are appropriated to the operation of introducing the fulminate into the small copper tubes or capsules, while a shed designated the "loading shed" is appropriated to the same use, and to the compressing of the fulminate in the tubes (with a proviso limiting the number of workpeople in each compartment of the workshop to one).

As a matter of fact, it appears that this arrangement has not been strictly adhered to. It has been the practice to introduce the fulminate in the loading shed, and thence to carry the filled detonators into the filling sheds, where the detonators are pressed singly by means of a hand press, screens being provided to protect (a) each workperson from the effect of an explosion in his or her press, (b) the person at one machine from the effect of an explosion in another machine, (c) the pressed detonators and those which are awaiting pressing from the effect of an explosion in the press. That the screens do fairly accomplish the objects with which they are provided, seems to be attested by the fact that although there have been several instances of detonators exploding in the press, the cases of personal injury arising therefrom have been few and trifling.

When the detonators have been pressed in the filling sheds it has been the practice to convey them to the packing shed for sifting, preparatory to cleaning them (in part of the loading shed), and packing them (in the packing shed). The detonators were carried in small circular teak boxes containing 200 pressed detonators; these boxes being placed in a larger mahogany box with a movable wooden lid, this box being constructed to take nine of the teak boxes=1,800 detonators. A woman was employed to carry the detonators from one building to another.

Circumstances of accident.

At the time of the accident the deceased was engaged in carrying some pressed detonators from one of the filling sheds to the packing shed. To do this she would have to follow the wooden platform for a distance of about 15 yards from the door of the filling shed, and then turn to the right along the main platform. The platform which connects the filling shed with the main platform has a slight ascent towards the main platform. It is, like the other platforms of the factory, three feet wide, and is formed of planks $6\frac{1}{2}$ inches wide, and with half-inch spaces between; the ends of the planks being nailed on to longitudinal wooden joists or bearers.

The girl Boyd appears to have been carrying four of the teak boxes=800 detonators, inside one of the mahogany boxes. The charge of fulminate (consisting of fulminate of mercury seven parts, and chlorate of potash three parts) is almost exactly seven grains for one detonator,=1 lb. to 1,000 detonators. Consequently the amount of fulminate which the girl was carrying (exclusive of such small quantities of spilt fulminate as may have been present on the outside of the caps and in the boxes) would be about four-fifths of a pound. It may at any rate be taken confidently as a little under a pound.

The girl had reached a point about 12 yards from the door of the filling shed and 3 yards short of the main platform, when the detonators which she was carrying exploded. The explosion inflicted such severe injury upon Boyd that she died almost immediately, never recovering consciousness or being able to give any explanation of the accident.

Effects of explosion.

The accident was not actually witnessed by any one; but there were some workmen employed in boxing some steam-pipes at a point only about 15 or 16 yards from the accident, but with their backs towards it; they and the workpeople in the several sheds were at once attracted by the noise, and ran to the girl's assistance. She was found lying off the platform with her head towards the filling shed, and with her left hand blown off, her right hand lacerated, her face lacerated on the left side, and some considerable injuries on the upper part of her body. She appears to have sustained no injury below the waist. At the spot where the explosion occurred, one plank of the platform was broken completely in two, downwards; the next plank was half broken, and the next but one was in the same condition. The planks in the neighbourhood of the accident were thickly indented with pieces of the mahogany box, and a few pieces of the detonators themselves. No whole or unexploded detonators were recovered. A few pieces of the mahogany box were blown into the open door of the filling shed, but neither this nor any other of the buildings of the factory had sustained any injury, nor were any other of the workpeople hurt. In short, the explosion was purely local.

Conclusion as to cause of accident.

Having carefully examined the site and taken evidence from all those who seemed likely to be able to throw light upon the occurrence, I am decidedly of opinion that the accident may be referred to the girl falling while carrying the box, and to the shock of the fall having caused the loose fulminate which is always liable to cling about the exterior of freshly pressed unsifted detonators, and which is necessarily present in small quantities in the boxes, to explode; the explosion thus established would naturally extend to the whole of the detonators present in the box. It was suggested that possibly the sliding forward of the teak boxes in the mahogany box, if the girl had slightly tilted the latter, might have produced enough friction on some spilt fulminate to explode it. I am not prepared to say that this is actually impossible, but I am of opinion that it is very improbable that the accident arose from this cause. In the first place, it is not very easy (even if it be possible) to produce such friction in this way as would occasion an explosion. I tried the experiment several times in company with Mr. McRoberts (the Company's chemist), Mr. Klindworth, the manager of the factory, and Mr. Cox, the foreman. We even rubbed a teak box strongly several times over some fulminate spilt on a smooth mahogany surface without producing any explosion. Still I am not prepared to say that an explosion might not be thus occasioned. But in the present instance the condition of the platform seems to point conclusively to the fact that the box containing the detonators was in contact with it at the moment of the explosion. Otherwise, and assuming the explosion to have occurred at the height of the girl's waist, it is in my judgment impossible that the planks of the platform

could have sustained any considerable injury such as I have stated had been produced. As against the theory that the girl dropped the box and so caused the explosion, there is the testimony of the blown-off left hand and the lacerated right hand to establish that the box must almost certainly have been in her hands when the explosion occurred; while there is the further fact that the girl's injuries were all above her waist, which is also inconsistent with the explosion having happened from a dropped box.

I therefore have no doubt that the unfortunate girl fell with the box, which she was probably carrying like a tray in front of her, and that the explosion occurred on the box striking the ground and while the girl was falling on to it; or she may have fallen with her feet off the gangway, which would account for her lower extremities not sustaining injury. It is a fact that women employed in this factory have fallen several times on these platforms. Mr. Cox, the foreman, says that he has seen them do so several times, and it was a matter of complaint, especially on the ascending platforms, that they were very liable to catch their toes in the spaces between the planks. Mr. Cox himself, a few days before this accident, had fallen, through the tilting up of a plank, the nails of which had drawn in the rotten wood. I carefully examined the planks and woodwork about the place where the present accident occurred, and I caused them to be examined by a joiner. There was nothing to indicate any failure. The wood was thoroughly sound, and there was nothing to warrant the belief that any of the nails had drawn. The accident cannot therefore in my judgment be referred to any defect in the condition of the platform at this part, but solely to the accidental tripping of the girl, perhaps by stepping carelessly off the platform, but more probably through her toes catching in the spaces between the planks.

Suggestions as to precautions to avoid accidents in future.

This conclusion necessarily leads to the consideration of how an accident of this sort can be avoided for the future. Having regard to the very sensitive character of this composition, and to the great danger arising from the fall of a box containing detonators and some loose fulminate, I am decidedly of opinion that adequate safety will not be secured so long as the detonators and composition are carried by hand from one shed to another. A wheeled truck should be provided, and this truck should run on rails so as to avoid the risk of its falling from the platform.* The only difficulty in regard to the introduction of this system lies in the platforms not being level; but the necessity for making some provision of this sort is so marked that I am of opinion that neither pains nor expense should be spared to effect the necessary levelling of the platforms, and to perfect the arrangements for connecting the different sheds with a suitable tramway. I have also suggested that some accession of safety would be derived from placing the detonators, as they are pressed, into a box containing saw-dust, cushioned and protected in which they could be conveyed to the sheds where the operations of cleansing and sifting the detonators are to be performed.

Both these suggestions are at present under the consideration of the Company, and the readiness which the Company have always displayed to adopt in their factories and magazines such precautions as may be reasonably expected to contribute to the safety of the workpeople and the prevention of accidents leaves me under no anxiety as to their ultimate adoption. Steps have already been taken by the Company to rectify one or two irregularities in the working of the factory which my inquiry brought to light, but with which it is proper to observe this accident does not appear to have been in any way connected.

Accident not the result of assignable neglect.

I am glad to be able to report that this accident does not appear to have been the result of any assignable neglect or of the disregard of regulations laid down for this factory. It is essentially an explosion which falls within the category of accidental; and is one of a class which in so sensitive, delicate, and hazardous a manufacture as that of detonators must, it is to be feared, be expected occasionally to occur, until a more extended and practical acquaintance with the peculiar risks of this industry than English manufacturers at present possess,† enables the various sources of danger to be more effectively controlled. The teaching, however, of this accident is plain, and will, I trust, be duly appreciated by those who are engaged or contemplate engaging in the manufacture of detonators, viz., that the conveyance from one part of the factory to

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* An accident occurred in this factory on the 17th May 1878, by which two girls lost their lives. It resulted from the upsetting of a barrow conveying the detonators from the magazine to the worksheds being upset off the platform by the skylarking and misconduct of two girls who were both killed. (See Annual Report of H.M. Inspectors of Explosives for 1878, pp. 29, 63.)

† Hitherto detonators have been made almost exclusively abroad (generally in Germany) and imported into this country.

M 402. Wt. 3795.

another of the semi-manufactured articles, or of any cases in which loose composition, in however minute a quantity, is liable to be present, needs to be carefully surrounded with very special precautions.

I have, &c.
V. D. MAJENDIE, Major, R.A.,
H.M.'s Chief Inspector of Explosives.

The Right Hon. the Secretary of State,
Home Department.

LONDON:
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7.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending the Destruction by Explosion of the Press House of Mr. S. Sharp's Gunpowder Factory at Chilworth, near Guildford, on 10th February 1879;

BY

MAJOR V. D. MAJENDIE, R.A.,

H.M. CHIEF INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, February 20, 1879.

I HAVE the honour to report that, in obedience to your Order of the 15th February 1879, (H.O. 50496–17,) made under the 66th section of the Explosives Act, 1875, I have held an inquiry into the circumstances attending the destruction by explosion, on the 10th February 1879, of a press house in Mr. Sharp's gunpowder factory at Chilworth, near Guildford, by which two men (George Goodchild and Alfred Baker) were killed.

I also attended the adjourned inquest on the bodies of the deceased which was held at Chilworth on the 18th February by Mr. Hull, one of the coroners for the county of Surrey. In accordance with the provisions of the above-mentioned section of the Act I beg to furnish the following Report:—

The Chilworth gunpowder factory is the property of, and is personally managed by, Mr. Samuel Sharp, of Chilworth and 59, King William Street, City, London, and has been in the occupation of his family since 1818.

Origin, situation, and distribution of factory.

It is situated about four miles from Guildford, and is stated to be one of the oldest gunpowder factories in the country, if not the oldest, dating from about 1590, when the Evelyns are said to have first brought the art of making gunpowder from Flanders, and about which time they were appointed sole makers of gunpowder in the south of England.*

Owing to the factory having been erected at a time when the country was far less densely populated than it is at present, and when consequently large unoccupied tracts of land were not difficult to obtain, the site was not selected with a view to any special advantages in respect of sheltering mounds or hills, and may be described as generally flat, with a slight fall towards the north, above which, on the opposite side of a wide meadow, the ground rises considerably.

But the immediate vicinity of the works is still fairly free from buildings, and in the works themselves, although there are some instances of undue proximity of buildings, the distribution of the buildings is generally not unsatisfactory, and the mounds and screens which have been erected in places, and the thick trees which have grown up, supplement to a great extent deficiencies of isolation.

A proportion of the mills are worked by water drawn from the river Tillingbourne, and the water ways about the factory are utilised in the conveyance of the semi-manufactured explosive from one part of the establishment to the other.

On the coming into operation of the Explosives Act, 1875, Mr. Sharp applied for and obtained a Continuing Certificate (No. 11, dated 20th March 1876) to constitute the factory "a lawfully existing" factory for the manufacture of gunpowder for the purposes of the Act.†

* A Handbook of the Manufacture and Proof of Gunpowder. By (the late) Captain F. M. Smith, R.A., p. 6. London, printed for Her Majesty's Stationery Office.

† An Amending License (No. 55, dated 8th August 1878) has since been obtained, authorising certain alterations in the factory, none of which alterations, however, have any bearing upon the present accident.

The accident to which this report relates occurred at about 9.30 a.m. on the 10th February in a building in which the breaking down of mill cake and the pressing of gunpowder were carried on.

This building is marked "31 Press House" on the plan attached to the Continuing Certificate; it was destroyed in 1864 by a similar explosion, the origin of which was never accurately ascertained.

Detailed description of injury caused by explosion.

Only two persons were at work in the building at the time of the explosion, viz., George Goodchild and Alfred Baker. They were both killed instantaneously. Their bodies have been found in a field to the south-west, at a distance of nearly 130 yards from the exploded building.

Loss of life.

No other persons appear to have been near the building at the time of the accident, and no one except the two men who were killed sustained any injury.

Damage external to factory.

The damage to buildings and property was confined to the factory itself, except in respect of the breaking of some panes of glass in a row of cottages distant about 270 yards to the south of the "press house," and the breaking of some glass and injury to some ceilings in Chilworth House, distant about a quarter of a mile to the north-west, and so placed on rising ground as to be exposed to the full effects of the explosion.

Damage internal to factory.

In the factory no other building beside the press house was exploded or wholly destroyed. The damage was as follows:—

Beyond the "press house," where the explosion took place, there were six powder buildings in an easterly direction, viz.:—

The middle glazing house (No. 33), the packing house (No. 34), the store (No. 35), the upper expense magazine (No. 37), the corning house (No. 39), and the upper glazing house (No. 40). The damage done to these was as follows:—

Middle glazing house (No. 33), distant about 95 yards, and in great measure screened by an earth mound about 10 ft. thick. It is a wooden building with tiled roof, and the only injury was some broken windows and frames; in one case the whole window frame had been blown out. None of the tiles were disturbed, although these were above the mound, and so did not benefit from its protection.

Packing house (No. 34), distant about 123 yards, and screened by the mound above mentioned, by a second mound to the east of the middle glazing house, and by the glazing house itself, sustained no injury.

The stove (No. 35), distant about 220 yards, and screened by the glazing house and packing house and the mounds above mentioned, had glass in two of its windows broken and the lead setting of one of the windows drawn out and bent.

The upper expense magazine (No. 37), distant 283 yards, sustained no damage (this building has no windows).

The corning house (No. 39), distant about 353 yards, had a few panes of glass broken.

The upper glazing house (No. 40), distant about 460 yards, sustained no injury of any description.

The greater number of the buildings lie to the west and north-west of the exploded house, and in this direction the nearest building was No. 3 (water) incorporating mill (No. 26), distant only about 45 yards from the "press house," partially screened by mounds.

This mill building was constructed of boards lightly nailed on to a wooden frame, with roof of the same construction.

This building has sustained considerable damage, the larger proportion of the boards were off, the sides towards the press house, the front, back, and roof being almost completely stripped; some rafters were broken, as was also one rather rotten beam. This may be said to be the only real instance of structural damage in the factory.

The other mills stood at distances of from about 63 yards to 147 yards, and were all more or less screened by the numerous trees, by corrugated iron screens, and by slight undulations of ground, and to some extent by some low mounds, and the injury in these was confined to the stripping off or disturbance of a few of the lightly fastened timbers, and in the case of No. 3 (steam) incorporating mill (No. 22), distant about 90 yards, some of the canvas of which the mill walls were composed had been slightly rent. The engine house, a masonry building at somewhat less than 90 yards, and to some extent screened, had its windows and some of the window frames slightly broken and some loose mortar shaken down.

All the drenching pans of the mills except those of the more distant steam mills acted, and drowned the charges on the mill beds.

The watch house, No. 19, distant about 120 yards, had some of the tiles disturbed and a few stripped off. Portions of the lath and plaster ceiling had fallen.

The mixing house (No. 15), distant about 168 yards, and rather more exposed than others of the buildings had a number of the windows broken and sashes smashed.

The lower glazing house (No. 12), distant about 233 yards, and considerably sheltered by trees and the other buildings, had some of the windows (which were set in lead) broken.

The dusting house (No. 8), distant about 300 yards, and well screened, had the glass of some of the windows broken.

The lower charge house (No. 17), distant about 140 yards, the charcoal store (No. 14), distant about 193 yards, and the lower expense magazine (No. 10) were all buildings which could only have been structurally injured, if at all, and they all remained unaffected.

The foregoing so far as I could ascertain by a close examination of the factory comprises the whole of the injury to the various buildings.

Summary of observations as to extent of damage.

It will be observed that in only one instance, viz., the lightly constructed No. 3 (water) incorporating mill at about 45 yards, was anything of the nature of what can fairly be called substantial structural injury sustained, and in this case the injury was of such a character as to justify the belief that it would not have been sensible in the case of a masonry building. In no instance did any of the masonry buildings sustain material injury, and the nearest approach to injury of this description was towards the east in the fracture of a few of the window frames and sashes of the glazing house at 95 yards, and towards the west in the similar damage inflicted upon the windows of the engine house at about 90 yards, and of the (rather exposed) mixing house, at about 168 yards. The incorporating mills showed the effects of the explosion more than any of the other buildings, a circumstance which is of course ascribable to the facts; first, that these mills were on the whole the nearest buildings to the scene of the explosion, and, secondly, that they were all purposely of a light and fragile construction.

Causes to which the comparatively slight amount of damage was probably due.

As the quantity of gunpowder which exploded was probably at least 1,800 lbs., and with dust, &c. may be set down roughly at not less than 2,000 lbs., and as about 900 lbs. of this was, as I shall presently show, almost certainly in the press and therefore under conditions of confinement favourable to the development of force, the amount of injury inflicted upon the buildings of the factory must be regarded as very inconsiderable, a result which I believe to be attributable mainly to the facts, (1) that the press house itself was so situated that two of its sides (one of them being the side towards the west or main portion of the factory) were in a great measure backed by an excavated bank, brick-revetted, (2) that various mounds and screens have been erected at different parts of the factory, and (3) to the presence of numerous large trees, which at places formed an almost impenetrable screen.

Area of distributed *débris*.

I took some pains to ascertain the distance to which the débris was thrown. Owing in part to the bank which backed the press house on the south and south-west, in part to the direction of the wind (at the time of the accident south-west), and in part, as I believe (a belief which I shall presently justify), to the fact that the explosion derived its impulse from west to east, by far the most considerable portion of the débris lay scattered in the meadow below the works in a north-westerly to a north-easterly direction, the débris to the east of north preponderating greatly.

This meadow was strewn up to a distance of fully 200 yards with pieces of blackened timbers, some of them of considerable dimensions. One large piece of an old (disused) press-box which had stood in the exploded building, and weighing, I should say, over 2 cwt., had been thrown about 100 yards to the north-west. Another large piece of the same had been projected almost due north about the same distance.

Towards the south-west, south, and south-east, the amount of débris projected to any distance was comparatively very small.

The bodies of the two unfortunate men were found, as has already been stated, almost south-west, some 130 yards off, and a considerable distance apart. I understand that hardly any débris had been recovered at a greater or even at so great a distance as this.

To the east and west little or no débris was projected to any distance, owing to the trees.

Damage in immediate vicinity of the exploded building.

In the immediate vicinity of the exploded building the effect was of course much more marked and violent. Several trees were cut in two or blown down, large limbs were torn off, and the ground was thickly strewn with bark, timbers, pieces of machinery, portions of clothing, and the other articles which compose or are to be found in a press house. The "press house" itself was a wooden building with slated (wood-lined) roof, and stood upon a six-feet foundation wall of brick, of which little traces could be observed, except in the south-west corner and along the west and south sides.

But in the midst of the ruins stood the remains of the press, the cylinder resting upon the brick supports, one of which was fractured through, while the 12-inch ram was in a lowered position in the cylinder, with one of the copper plates resting uninjured upon it (a photograph shows the site of the explosion).* The four strong iron columns which supported the head of the press had disappeared, and I found they had been broken off, and projected in directions nearly corresponding with those which they occupied in the press; the massive iron head of the press was broken in two, the larger piece having been thrown about 15 yards to the east, and the smaller having been thrown about the same distance to the north-east.

The very substantial and heavy wooden press block (against which the top press plate abutted when the pressure was applied) lay several yards to the north-east of the building.

Of the breaking-down machine which had stood to the west of the press, portions were found similarly distributed. One of the four heavy zinc rollers lay near the press, rather to the south of it; another lay about six yards beyond the press to the east, a third had been projected to the north-west, and the fourth almost due west.

A heavy piece of gearing lay some yards to the south-east, the distribution being remarkably symmetrical.

I notice these details, because, as will hereafter appear, they seem to bear upon the circumstances of the accident, the main and noticeable point in regard to them being that while the parts of both the machines were distributed in a manner so comparatively even and regular as to indicate that in each case a powerful force had operated from within the machine,—in other words, to justify the inference that each machine was almost certainly charged at the time of the explosion, there was nevertheless a sufficiently marked tendency on the part of the fragments of the press towards a north-east and east direction to warrant the assumption that when the press exploded it was itself subject to a violent impulse operating from the west.

Operation of pressing gunpowder.

Before proceeding to consider the circumstances under which the explosion occurred, it is desirable to offer a few general observations on the subject of pressing gunpowder.

The late Captain Smith in his Handbook of the Manufacture and Proof of Gunpowder, after explaining the objects with which gunpowder is "corned" or granulated, goes on to remark that, "The only perfect way of converting gunpowder into service-
"able grains without in any degree whatever interfering with the perfect incorporation
"of the ingredients, is first to compress the soft material" (as it comes from the incorporating mill partly in the form of soft cake, partly dust) "into hard masses by
"pressing alone, and then to crush up these masses into the description of grain required.

"The object of pressing, then, is to convert the soft dusty mass of incorporated
"ingredients, now gunpowder, into hard cakes of the particular density which is found
"to give the best results when the powder is finished.

"Once the cakes are formed they can be subsequently broken up by various con-
"trivances into grains of any size, all of which will have a uniform density and hardness,
"and which can be freed from dust, and glazed and polished, so as to bear handling and
"transport without breaking or crumbling."†

Substantially the pressing of gunpowder may be said to consist of two distinct operations, viz.:—(*a*) the preparation of the gunpowder for the press as it comes from the mills, technically called "breaking-down," and (*b*) the actual pressing.

The former operation is not invariably practised, but it facilitates the placing of the powder in the press, and the production (especially in the case of thin press cakes) of uniform results. In some instances the breaking down is roughly effected by means of mallets, in other instances a "breaking down" machine is provided, generally consisting of one or more pair of gun metal or zinc rollers, between which the mill cake is crushed to a condition of meal powder.

The operation of pressing is effected by distributing in layers the meal powder produced by the operation of breaking-down between plates of gun metal or copper or leather in an hydraulic or screw press, and then applying the requisite pressure.

The amount of gunpowder which may be subjected to pressure at one time in any press house of a gunpowder factory under Continuing Certificate is by statute forbidden to exceed 10 cwt., while the whole quantity in the house may not exceed 20 cwt.‡

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* It has not been thought necessary to reproduce the photographs to accompany the printed report.

† Handbook of the Manufacture and Proof of Gunpowder, pp. 44 and 45.

‡ Explosives Act, 1875, Schedule I., Part I., § 2. In the case of new factories the quantities to be pressed would be regulated by the license, and in the case of factories under Continuing Certificate the provision is susceptible of modification by means of an amending license. The provision was continued from the old Gunpowder Act of 1860. It was doubtless originally recommended by the consideration that powder under pressure exercises exceptional force.

It is obvious that neither of these operations is free from special risks.* The special risks in breaking down are similar in kind to, though not so formidable in degree as those which attend the corning or granulating of gunpowder, and, apart from risks arising from a defective machine or a heated bearing, consist chiefly in the possible presence in the powder while it is undergoing crushing or grinding of some hard foreign substance, such as pebbles or grit or pieces of metal, or a bolt or nut from the machinery.†

The special risks in the pressing of gunpowder are of the same character, and it must be evident that wherever gunpowder is being subjected, as in the process of breaking down (whether effected by means of blows from a mallet, or by means of crushing between rollers) or in the operation of pressing, to any considerable application of force or friction, the presence of any hard foreign substance in the powder so being treated must constitute a very active and formidable risk.‡ Although the necessity of excluding dangerous foreign substances from powder buildings is generally recognised, the accomplishment of this object, as Captain Smith remarks, "is not so easy of attainment as may be supposed," even if all the well known precautions have been taken in the way of providing wooden or wood-lined buildings, of sifting or searching the ingredients (as required by the statute) before incorporation,§ by providing for the changing of the boots, and for the maintenance of what are technically known as "clean floors," and of avoiding the use of unsuitable tools, or the placing of the same in positions where they may come into contact with grit, there will still remain the possibility of the presence of a fragment of metal broken off some machine, or some gritty particles carried by a gust of wind into a house and there swept up unobserved with the dust.‖ It is not, therefore, surprising to find that several press-house explosions are on record. Captain Smith enumerates nine between May 1858 and June 1870, causing 44 deaths.¶ Press-house explosions are necessarily generally among the most formidable and destructive, because although, as already stated, the amount of powder in these houses is limited by statute, it most commonly happens that a proportion of that powder is under conditions which are favourable to the development of its full force.

At Waltham Abbey, on the principle of isolating the several risks as much as possible, the operations of "breaking down" and "pressing" are prudently separated, being carried on in separate buildings. In private factories the operations are, I believe, invariably carried on in the same building.

System of working at Chilworth. Breaking-down machine.

I shall now proceed to explain the system of working in vogue at Chilworth. The building known as the press house, and in which the accident occurred, was used for breaking down and pressing; the former operation being effected in a machine which had been manufactured in 1864 (after the former explosion of this house) by Messrs. Filmer and Mason of Guildford, and which consisted of a simple frame work of wood carrying the two pairs of smooth zinc rollers, $8\frac{1}{2}$ inches diameter, one above the other. The rollers were set at about $\frac{1}{4}$ inch from one another, and with an interval of about 18 inches between each pair. They were so arranged that in the event of a somewhat larger piece of mill cake than usual presenting itself, or in the event of an accumulation accruing at the rolls, the space between the rolls would be at once slightly enlarged,

* By "special risks," I mean risks independently of and distinct from those which attend the manufacture of all gunpowder; risks, that is to say, specially connected with and incidental to the particular operation.

† Captain Smith remarks in his work that experience shows the kindred process of granulation or corning to be a peculiarly dangerous one. Out of 29 great explosions in powder works between May 1858 and June 1870, no less than 11 originated in corning houses, and resulted in the loss of 44 lives (p. 61). Last year a fatal accident occurred in the corning house of the Elterwater Company, and in 1876 two accidents occurred in the East Cornwall Powder Company's factory, one in the granulating house and the other in the breaking house. The last-named accident was traced almost beyond doubt to the presence of grit in the powder which a man was breaking with a wooden mallet.

‡ In our annual report for the year 1878, Major Ford and I have had occasion to remark on eight accidents which have occurred in the pressing of wet gun-cotton, due unquestionably to the establishment of some intense local friction sufficient, first, to dry small portions of the wet gun-cotton, and then so to heat as to inflame them.

§ Explosives Act, 1875, sec. 10, § 13.

‖ Attention may here be usefully directed to a list given at pp. 366–7 of the Report of the Parliamentary Committee on Explosives, 1874, of articles found at various times in the Government gunpowder works at Waltham Abbey, or in barrels of gunpowder at the Government establishments of Purfleet and Woolwich, where the most vigilant care is exercised to exclude foreign substances. There are 38 articles of this sort, and they include articles of iron, steel, copper, and stone, a clay pipe, bullets and percussion caps, and even in one case a lucifer match, which was found in a barrel of powder from Purfleet, and a detonating tube, which was found in a barrel of gunpowder at Bull Point. It is also noteworthy that there are two examples of stones found in press houses, one a stone of $1\frac{1}{4}'' \times 1\frac{3}{4}''$, found on the top plate while loading a press in 1860, the other a stone $\frac{3}{8}$ in. sq. found in some press cake the same year.

¶ Handbook of the Manufacture and Proof of Gunpowder, &c., p. 49.

special springs enclosed in india rubber cases operating to immediately bring the rolls back to their normal position. A pair of copper "scrapers" for each pair of rolls was fixed to the machines, and so set as to remove incrustations. The rolls travelled at about 30 revolutions a minute. The bearings were provided with suitable lubricating arrangements. The greater part of the machine was recovered. The rolls and the spindles on which they worked were intact; some of the wheels and shafts were broken, but it is impossible to say how much (if any) of the fractured condition of the gearing was due to the explosion, the pieces having been torn asunder with great violence and projected to considerable distances, or whether any of it had occurred *before* the explosion and had given rise to the same. This machine had been at work successfully since 1864, and the injured men were thoroughly familiar with its working and construction.

Description of hydraulic press.

The hydraulic press was manufactured in 1864 by Messrs. J. and E. Hall of Dartford, and had continued at work ever since, except that a portion of it (the cylinder) had been removed in 1872. It was of a well-known and well-tried construction, and is substantially the same as Messrs. J. and E. Hall supply for the Government factories, to foreign Governments, and to the leading firms of gunpowder makers. It consisted of a 12-inch ram, 3 feet 6 inches long, working in a cylinder 3 feet 5 inches deep (thus giving an inch clearance between the top of the ram and the top of the cylinder when the former is down). On the top of the cylinder is fixed a stout iron platform, or table, called the "follower," 2 feet 10 inches square. On this is a block of wood, and the powder is arranged on this in layers of the requisite thickness and depth, with copper press plates between. No press-box is employed, the edges of the layers of powder being shaped by pieces of wood loosely placed upon each plate as the layers are successively formed.

The top of the ram consists of a massive block of iron, supported by four cast-iron cylindrical columns, each 10 feet $1\frac{1}{4}$ inches long, $4\frac{1}{4}$ inches diameter, and weighing about 4 cwt. The columns are attached to the corners of the body of the press, and to the corners of the press-head by means of stout plates, securely screwed on. The "follower," moves up and down quite free of the columns; the powder abutting, as has already been stated, upon a movable press-block underneath the press-head. The water enters the cylinder through a pipe $\frac{1}{4}$ inch diameter, the power being derived from a turbine and a pair of hand pumps.

The power for the breaking-down machine is also derived from the turbine. Both machines had been thoroughly cleaned and overhauled by the deceased men on the Friday preceding the accident.

In addition to the breaking down and pressing of the mill cake, the operation of tapping the press cake (on the press plates) with a wooden mallet, so as to free it from the plates, and so far to break it up as to admit of its being introduced into the barrels, was carried on in the house, two copper chisels were provided (to ease the cake from the plates), and one wooden mallet.

The press house was served by water carriage, and it was the practice of the boatman to bring a supply of mill cake to the house so soon as a red flag provided at the press house for the purpose was lowered by the press men, the lowering of the flag being a signal, 1st, that the press men were ready for a supply of mill cake; 2nd, that they had (as required by the Act when a quantity of powder exceeding what may be *in* the house is brought within 20 yards of the same) stopped the machinery.* The boatman delivers enough powder to constitute a press, viz., eight barrels, of about 110 lbs. each, equal 880 lbs., and removes the same quantity of press cake. The machinery remains stopped and the flag lowered until the boat has reached a spot about 30 yards from the house.†

On the day of the accident, the men had come to work as usual at 7 o'clock. The boatman (Peter Bish) had, as was his custom, conveyed from the charge house to the press house eight barrels (of 110 lbs. each) of "tower proof" powder meal, and had removed from the press house to the corning house one "press" (eight barrels of 110 lbs.) of press cake. A short time before the explosion he had conveyed a second lot of mill cake to the press house, and had removed a second lot of press cake from the house. He had left the press house with his boat load about six minutes, and had just reached the store (distant 200 yards),‡ when the press house blew up. Bish states that he

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* Explosives Act, 1875, § 24, 2nd para.

† This arrangement is also to secure conformity with the statutory provision above mentioned.

‡ My experience has shown me that it is rarely safe to rely upon the estimates of the intervals of time formed by workmen and others on these occasions, but Mr. Sharp, at my request, has caused the distance from the press house to the store to be traversed by the boat experimentally, and has found the time to correspond very closely with the estimate.

spoke to both of the deceased when he was at the press house on this second trip, and also himself looked into the house. Both the deceased, he says, were quite sober, and appeared to be proceeding regularly with their work. He observed that the press was loaded and ready to press up, but the pressure was not on. Bish was the last person at the house before the explosion.

The explosion is described as having been very loud, and distinctly a single report.

There are certain conclusions which may be derived from the statement of the boatman, from my observations on the spot, and from all the surrounding circumstances, which it is important to note by way of clearing the ground for an examination of the cause of the accident.

Grounds for believing that both machines were charged at the time.

1st. It is, I think, abundantly clear that there was powder in both the machines at the time of the accident. This may be inferred from the circumstances that the débris and part of both the machines testify, as already remarked, by their symmetrical distribution to the fact that they had each of them been subjected to some powerful internal force, such as could only have been derived from the explosion of a quantity of powder within the machine.

Grounds for believing that the press was not in full operation.

2nd. There can be little doubt that the press was not at the time of the explosion in full operation, because—

(*a.*) The pressure had not, Bish says, begun to be applied when he left the house six minutes before, and there would not have been time during this interval, even had they applied the pumps at once,* to get up the full pressure;

(*b.*) The amount of water found in the cistern after the explosion was so large as to show that very little pressure, if any, could have been on the press; and

(*c.*) If the pressing had been in active progress, Baker in the ordinary course of working would have been in the pump room to the west, watching the gauge, and Goodchild to the south at the turbine gate, so that Baker's body would almost necessarily have been conveyed more to the west than that of Goodchild. As a matter of fact, however, Goodchild's body was found considerably to the west of that of Baker, and this position would almost exactly correspond with that which the men would naturally have occupied before they had begun to press or had only just commenced, viz., Goodchild to the west, behind the back of the breaking-down machine, and Baker to the south-east of Goodchild;

(*d.*) I am of opinion that had the powder been under full, or even under considerable pressure, the explosion would probably have been more violent in its effects.

Grounds for believing that the explosion did not originate in the press, but in or at the breaking-down machine.

3rd. There are very strong grounds indeed for believing that the explosion did not originate in or at the press, but originated in or at the breaking-down machine; thus,—

(*a.*) There is unmistakeable evidence of the general *direction* of the force exerted. Assuming the press to be exploded by an explosion communicated from the west or north-west of it, it would be reasonable to expect to trace an impulse derived from that direction. At the moment when the explosion was communicated to the press charge, it would no doubt be communicated by means of a quantity of heated gas generated by the powder first exploded, and issuing, therefore, in all directions. The gas which reached the press charge would be travelling towards the east or south-east, and the fragments of the exploded press would consequently have a tendency to take that direction, rather than a direction opposed to the original force. It would also be reasonable to expect with regard to the parts of the machine where the explosion first commenced, that they would exhibit no such tendency to assume a particular direction, being acted upon only by what may be termed a central or internal force.† And this exactly coincides with what was actually observable in the present instance. As already stated in my remarks on the nature and extent of damage, "While the parts of both the machines were distributed in so "comparatively even and regular a manner as to indicate that in each case a "powerful force had operated from within the machine,—in other words to "justify the inference that each machine was almost certainly charged at "the time of the explosion, there was nevertheless a sufficiently marked "tendency on the part of the fragments of the press towards a north-east "and east direction to warrant the assumption that when the press exploded

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* As already stated, the regulation, if observed, would forbid pressmen from recommencing work with machines until the boatman had reached a spot about 30 yards off.

† I am here referring to heavy pieces of machinery, which would not be liable to be acted upon by the *wind*, but which must assume these directions in obedience to some much more powerful force.

" it was itself subject to a violent impulse operating from the west" (*ie.*, operating from the direction in which the breaking-down machine stood). This impulse is also especially marked in respect of the large portions of the press, the foundation, the cylinder, and the ram and follower, which have not been actually carried away; for an examination of these (see photograph).* shows that the cylinder and ram have been carried bodily towards the east or south-east fully 6 inches, inflicting serious injury on the masonry; while of the four columns, the only one unbroken was one of the columns on the north side;

(*b.*) It is comparately unlikely that the explosion would originate at a machine which was not actually at work, and I have stated above the grounds for believing that the press was not so at work at the time of the accident.

Examination of possible causes of explosion.

In proceeding to endeavour to ascertain the cause of the explosion I shall follow the course which I have adopted on former occasions, and shall set out *all possible* causes which it appears to me may be operative in a case of this sort, dismissing those which appear the most improbable, and examining more carefully those which offer some degree of probability, and thus by a process of gradual elimination arriving, if not at *the* cause, at any rate at one or two of those causes among which the true explanation is most probably to be found. The following summary, I believe, includes all *possible* causes which can be suggested in cases of this sort:—

Summary of possible causes.

A.—Causes immediately connected with Tools or Machinery.

1. Inherent defect in the construction of machinery or implements.
2. Defective working of machine or tools, due to—
   - (1.) Fracture, distortion by wear or otherwise,
   - (2.) Clogging,
   - (3.) Other disturbance,
   - (4.) Improper application.
3. Fall of tool or portion of machinery.
4. Heated bearing.
5. Ignition caused in repairing or cleaning machinery.

B.—Causes independent of Tools and Machinery.

(*a.*) *Accidental Causes.*

6. Lightning.
7. Fire from external source.
   - (1.) Adjacent chimney.
   - (2.) Passing engine.
   - (3.) Other source, *e.g.*:
     - (*a.*) Men taking fire from watch-house or engine-room (in their clothes or in cooking utensils or otherwise); or,
     - (*b.*) Fire from glue pot.
8. Spark from,—
   - (1.) Article of iron.
   - (2.) Article of glazed earthenware.
9. Spontaneous ignition of cotton waste.
10. Smoking:—
    - (1.) In or near building.
    - (2.) Unextinguished pipe in workman's pocket.
11. Lucifer match—
    - (1.) From workman's pocket.
    - (2.) Left lying about the factory.
12. Foreign substances, such as small stones, gritty particles, articles of metal, nuts, bolts, nails, &c.—
    - (1.) On shoes or clothes.
    - (2.) On tools, machines, or cotton waste.
    - (3.) On barrels or barrows.
    - (4.) Blown or fallen into the building.
    - (5.) In the ingredients,
      - (*a.*) If imperfectly sifted.
      - (*b.*) Contracted from walls and roofs of the buildings after sifting.
      - (*c.*) Derived from a machine or tool.
      - (*d.*) Contracted during conveyance.

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* It has not been thought necessary to reproduce the photographs for the purposes of the printed report.

(*b.*) *Wilful Acts.*

13. Matches, &c. wilfully introduced during the absence of workpeople.
14. Wilful ignition of powder dust outside.
15. Wilful introduction into ingredients of foreign substances before the same are brought into the building.
16. Wilful act of workmen,
    (1.) While in state of insanity.
    (2.) While in the state of intoxication.
    (3.) With object of committing suicide.

Certain possible causes may be dismissed in this case

I believe that in this instance the whole of the "possible causes" which fall under the head of "wilful acts" may be safely dismissed. So far as I have been able to ascertain, no bad feeling likely to prompt so diabolical an act as the intentional causing of the accident has existed among the workpeople or in the neighbourhood. No workpeople had been recently discharged or punished, or were under trial of punishment, discharge, or reduction of wages. Mr. Sharp assures me that he is unaware of anyone who is likely to have been animated with evil feelings towards himself or his factory, and he sees no grounds whatever for suspecting that the act was maliciously caused. As regards the possibility of the explosion having been due to the intentional act of one of the two workmen engaged in the house while in a state of intoxication, insanity, or mental disturbance, these men are described by Mr. Sharp and others as being thoroughly trustworthy, steady men, whom Mr. Sharp personally has known for some 15 years, during which time there does not appear to have been an occasion on which it was necessary to find fault with them for being the worse for liquor; there is abundant evidence that on the morning in question they were quite sober, and, as far as could be judged by their fellow workmen, capable in every way for the regular discharge of their duties.

There are also, I believe, no grounds for suspecting that either of these men was under the influences which would be likely to induce him to commit suicide. I have, therefore, no doubt in my own mind that the accident was not the result of any wilful act.

Remarks on absence of sufficient precautions for exclusion of unauthorised persons.

But before leaving this branch of the subject, I think it right to call attention to the fact that the factory is not enclosed by any fence or other impediment to the unlawful entrance of trespassers and evil-disposed persons, and although Mr. Sharp tells me that the character of the neighbourhood is quiet and orderly, so that he very rarely has had to complain of any act of trespass, and although warning notices to trespassers, as required by Section 77, have been posted, I am of opinion that the requirements of Section 23, which enjoins that "the occupier of every factory . . . "shall take all due precaution . . . . for preventing unauthorised persons having "access to the factory," are not satisfied by this condition of things. It cannot be successfully contended that the occupier of a factory takes "all due precautions" to prevent unauthorised persons having access thereto if he provides no fences for the same, and leaves it all night and on Sundays without any watchman or special protection. The Legislature surely intended that the "due precautions" should be of an active and effective character, and contemplated, of course, something more than the mere posting up of the warning notice to trespassers enjoined by another section.

I will now pass to a detailed examination of the other "possible causes" included in the above list.

1.—*Inherent Defect in the Construction of Machinery or Implements.*

Examination of possible causes.

Defective construction of machinery or tools.

As regards the press, if my conclusion as to this not having been in active operation at the time be correct, the accident could not have originated here; but apart from this, the construction of the press was such as to place it above reasonable suspicion. The construction is a thoroughly well-tried one, and nothing that has come to the knowledge of the manufacturers, by whom, as already stated, presses of this construction have been supplied to gunpowder works all over the world, has suggested to them the advisability of modifying the principles or details of the construction. Moreover, this very press has worked satisfactorily in this particular house since 1864.

The breaking-down machine was also of a well-tried construction, and had been used in this factory for the same length of time as the press. So long as both these machines were in good order, I can see no reason for suspecting them of any liability to cause accident. The mallet used in the building was of wood, the chisels were of copper, the barrels used were of wood. In short, there is reason to believe that the tools and machinery were well adapted to the work which they were required to perform.

2.—*Defective Working of Machines or Tools.*

Defective working of machines or tools.

This suggested cause opens up a much larger and more suspicious range of possibilities, but unfortunately it is a direction in which our inquiries cannot, in this instance, be satisfied. It is not in my judgment probable that the press was actively at work, indeed, I hold the opposite to be almost certain; and, if this be so, the accident could not have arisen from the defective working of the same. But it may be useful to point out, that even in the event of some fracture in the pipes and the descent of the ram there could be no contact between the "follower" and the top of the cylinder, because, owing to the difference in the length of the ram and the cylinder, there was a clearance of one inch. Moreover, Mr. Sharp states that throughout the whole of the recent frosts and intervening thaws the pipes had worked satisfactorily, and as at least one charge had been successfully pressed on the morning of the accident, they would appear to have been working correctly that day. Further, the amount of water in the cistern is a proof that the pipes could not at the time have been subjected to any such pressure as would have been liable to burst them or the cylinder. And there does not appear to be any other possible direction for failure of the press, whether by fracture, distortion, wear, clogging, or other disturbance. As regards the breaking-down machine it is impossible to express so confident an opinion. There is every reason to believe that the machine was actually in operation at the moment of the accident, and there can be no doubt, I think, that certain risks of accident would be incident to the defective working of the machine. Thus, the fracture of some part of the machinery might bring some of the metal surfaces into sharp and, perhaps, grinding contact, while I conceive it to be not wholly impossible that even the clogging of some parts of the machine might establish an amount of friction sufficient to raise adjacent or confined particles of gunpowder to explosion point. Whether any such cause was at work on this occasion we shall unfortunately never be able to ascertain with certainty. The fact that the machinery is much broken teaches us nothing. It may have been the cause, or it may have been the effect of the explosion. Further than this it is impossible in this instance to carry our inquiry into this branch of the subject, but it is a direction in which it appears to me that active suspicion is fully warranted.

As regards the tools, assuming only those provided to have been employed, it is of course *possible* for them to have been so improperly applied as to cause accident, *e.g.*, by the chipping of indurated powder from a metal surface with a copper chisel. indeed, the Waltham Abbey press accident of 1870 was caused by what appears to have been the not illegitimate use of a copper tool.* But there is no reasonable ground for suspecting that a tool was being so used, for any such application of the tool would almost certainly be in connexion with the removal of the press cake,† and this process it is unquestionable was not in progress.

3.—*Fall of tool or portion of machinery.*

Fall of tool or portion of machinery.

I do not see how this could occur with any part of the press. But it is not an impossible circumstance with some of the gearing of the breaking-down machine, and this is one of those causes to which, failing the actual discovery of the exact cause, a large amount of suspicion must attach.‡

4.—*Heated bearing.*

Heated bearing.

I do not think this can rank in the present instance among probable causes. Such a cause can only exist through the grossest carelessness; and, indeed, with comparatively light wheels performing only about 30 revolutions a minute, it is one which under any circumstances can be reckoned as only of the remotest probability. But, as before stated, in this case the machines had been overhauled and cleaned only two days previous to the accident.

5.—*Ignition caused in repairing or cleaning machinery.*

Repairing or cleaning machinery.

The answer to this suggestion seems to be supplied by the last paragraph above:—the machines had been overhauled and cleaned only two days previously; and therefore

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* "From the statement of one of the men who survived the accident a short time, it appears that they were unloading the press at the time, and making use of the copper chisel (or spud) to separate the press plates." *Handbook of the Manufacture and Proof of Gunpowder*, p. 49.

† Except in connexion with the cleaning of the machinery, as to which see 5, above.

‡ A serious accident occurred at Messrs. Bickford, Smith, and Company's blasting fuze factory at Tuckingmill on 30th March 1872, through the fall of a piece of metal of a machine against the steel standard of the machine causing a spark and igniting some powder. Eight women were killed.

it is scarcely conceivable that any necessity for cleaning and repairing them could have existed on the day of the accident. This answer is independent of the further observation that not only is cleaning or repairing in a danger building until the same has been cleansed by the removal of all powder prohibited by the General Rules in the Act (see sect. 10, § 5), but in Mr. Sharp's Special Rules is one expressly dealing with this point, as follows :—"If at any time the machinery or appliances should appear to the "workmen to be in an unsafe or doubtful condition, the machinery is to be at once "stopped, and the man in charge is immediately to report the same to the manager or "foreman, and the work is not to be resumed until the defective machinery has been "made safe, and authority given to that effect." (Special Rule, No. 18.) It is highly improbable, therefore, that the accident arose from this cause.

Necessity for periodical overhauling of machinery by skilled mechanics.

Before passing on to an examination of causes independent of the tools and machinery, I desire to remark that I am of opinion that the practice of the factory would be considerably improved if a periodical overhauling of all machinery were effected by a skilled mechanic. I am given to understand that Mr. Armstrong, the resident manager of the factory, is a thoroughly competent mechanic, but it does not appear to have been the practice to hold him responsible for the correct condition of the machinery. The workmen have practically been held responsible on this point, and Mr. Armstrong's supervision appears to have been rather of a general than of a particular character, and I have failed to discover that any definite system of periodical inspection of the machinery was enforced.

Passing to accidental causes independent of tools or machinery, we have,

6.—*Lightning.*

Lightning.

This may be at once disposed of. There was no lightning that morning.

7.—*Fire from external Source.*

Fire from external source.

Fire from adjacent chimneys, from a passing engine, or from a glue pot, may be dismissed, because the nearest chimney (that of the engine house) was distant 90 yards, and the wind would not have carried its sparks towards the press house. There are no locomotive engines employed in the factory, and fire could not have been brought in on a glue pot, for the very sufficient reason that glue pots are not required or used in press houses.

There remains, however, the question of whether it is possible that fire could accidentally have been brought into the building from the watch house by one of the workmen, either in the form of some smouldering particle of clothing (which had become ignited by the watch-house fire), or in the form of some ignited soot on a kettle or coffee pot. In the course of my inquiry it transpired that it was the habit of the press house men to go to the watch house about 9 a.m. for the purpose of boiling a coffee pot, and afterwards to convey the same into the changing room attached to the press house, and there to make their meal. The men whom I questioned on the subject stated that the persons so conveying the coffee pot from the watch house invariably took the precaution to dip it into the water course by the watch house door before taking it away, so as to extinguish any ignited sooty particles which might be adhering to it. On the morning in question, according to the evidence of two or three of the men, Alfred Baker (one of the deceased) brought his coffee pot as usual to the watch house, boiled it by placing it on a stone in front of the fire, and took it back to the press house. He wore his powder clothes (but not his powder shoes) while so doing. The statements made to me as to the time before the explosion at which this occurred differ. Thomas Edwards informed me that Baker came into the watch house about a quarter of an hour* before the explosion, and he was there when Edwards left shortly afterwards. If this be correct it would follow that Baker must have returned to the press-house with his coffee pot no great time before the explosion, as he would have in the intervening quarter of an hour† to boil his coffee and make his way back to the press house. James Dyer, however, says that as he was going towards the watch-house 20 minutes before the explosion he saw Alfred Baker returning into the changing room of the press house with his can in his hand, and he had a short conversation with him, Baker observing to him that he (Dyer) was late that morning.

This witness says that he observed the clock of the watch house when he entered,

* At the inquest Edwards stated that he thinks the time must have been 25 minutes.
† See footnote next above.

and it was then rather more than 20 minutes to the time at which the accident afterwards occurred. Bish, the boatman, fixes the time of Baker leaving the watch house at about 40 minutes before the accident; he says he was in the watch house when Baker left, and he then glanced at the clock, and it was 12 minutes to 9; the accident having occurred about 28 minutes past 9. All the witnesses agree that the men were in the habit of invariably dipping their cans into the watercourse as they took them out of the watch house, and Bish asserts most positively that he himself saw Baker do so on this occasion.

If Bish's statement as to the interval of time (40 minutes) which elapsed between Baker leaving the watch house and the occurrence of the explosion is correct, the establishment of any immediate connexion between the accident and the taking of the coffee pot from the watch-house fire into the changing room of the press house would certainly present some points of difficulty.

And Bish's statement derives some support from the fact that after he had left the watch house he must have proceeded to the charge house, got a boat load of eight barrels, covered it over, and conveyed it to the press house, which place he had left six minutes before the accident. All this would occupy time, and during that time it is reasonable to believe that if Baker had any fire about his clothing, or upon the coffee pot, to which the explosion might have been due, the accident would have occurred much sooner.

On the other hand, it was a wet morning, the men's clothes would be wet, and it is *possible* for the wet, powder-begrimed clothing, if a spark had fallen upon them, to remain smouldering for a considerable time, and not to break out actually into fire until the drier inner portions were reached. And if Edwards' statement as to the interval of time (a quarter of an hour, or according to his later statement, 25 minutes *minus* the time required to boil the coffee and to convey it to the house) be correct, not only would the connexion between the two occurrences be much more suspicious, but doubt would also be thrown upon Bish's statement as to Baker having dipped his coffee pot in water, because the whole of the evidence of this witness would be discredited.*

And in respect of this matter, there is another observation which it seems to me important to make. The question may no doubt be asked why if the man Baker had any smouldering fire about him the explosion did not take place *immediately* on his returning to the press house. The answer to this is that there is nothing to show that he entered the press house proper at all until shortly before the accident. He returned not to the press house proper, but to the changing room of the press (a small detached building), where there would be no powder. It was in the changing room that the men took their breakfasts, and it may therefore very well be that he did not enter the house until very shortly before the accident, and that the smouldering of his clothes, which had been continuing the while, at the moment of the explosion, communicated to some dry portion of the clothing and caused the ignition of some of the powder.

This explanation is not absolutely inconsistent even with the large interval assigned by Bish, but obviously derives greater probability in proportion as that interval is shortened to that assigned by Dyer or to that assigned by Edwards. Whether the explosion was actually caused in this way we shall of course never know for certain, but I must confess that the circumstance that a man went before the explosion with a sooty can which he had been boiling at an open fire, and in his powder clothes, straight from that fire into the changing room of the house in which the explosion shortly afterwards occurred, does suggest the suspicion that we are perhaps here very near the source of the accident.† In any case I feel bound to express very decided reprobation of such a practice. Mr. Sharp states that he was really not aware that the practice prevailed. I am quite satisfied that as a practical gunpowder maker, and one whom I believe to be most anxious to provide for the proper safety of his workpeople, he would not, had he been aware of its existence, have allowed it to continue for a single day, and I have little doubt that he was as surprised and concerned as I was to hear that such a practice had existed.

But this does not relieve Mr. Sharp from his responsibility. I would submit that the supervision in a gunpowder factory should be such as to render *impossible* the existence, unknown to those in charge of the works, of so dangerous and reprehensible a practice. I am of opinion also that the manager, Mr. Armstrong, should, if he was aware of the practice, have at once taken Mr. Sharp's opinion as to its prompt prohibition.

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* It is to be observed that his statement of the interval of time is not a mere estimate, but a deliberate assertion based upon the actual position (as he tells us) of the hands of the clock at this time.

† I have found by experiment that a square inch of damp powder-begrimed clothes may smoulder fully 10 minutes, and even longer.

8.—*Sparks.*

Sparks.

I have failed to discover any special grounds for assuming that the accident was caused by a spark struck by some article of iron (independent of the machinery),* and although the men used glazed earthenware basins to drink their coffee from, and these articles, if sharply struck together, are liable to emit sparks, there is not any sufficient ground for supposing that they were ever taken into the danger part of the press house, or where a spark so emitted could ignite powder. One of Mr. Sharp's Special Rules prohibits the carrying of keys, knives, or other articles of iron or steel about their person when employed in or about danger buildings or powder boats (special rule 4), and I consider that there is no sufficient warrant for suggesting that this rule may have been neglected on this occasion. It was proved that the regulations as to the removal of boots having iron nails in them had been observed, because the proper boots were recovered from the feet of both the unfortunate deceased.

9.—*Spontaneous Ignition of Cotton Waste.*

Spontaneous ignition of cotton waste.

The conditions were so unfavourable to the ignition of cotton waste—a cold February morning—that I consider this cause may be safely set on one side on this occasion. Moreover, I have questioned the engine room men as to the issue of waste to the press house; they both stated that the quantities issued were very small ("about as much as "would go into the two hands"), and the occasions of such issue very rare. It does not appear that any waste had been served out for the use of this house for many days.

10.—*Smoking.*

Smoking.

The evidence which I was able to collect on this point all went to show that Goodchild never smoked at all, and Baker only very rarely. Smoking, moreover, is strictly prohibited throughout the factory, even in the watch house, and the various men whom I questioned on the subject affirm most positively that this regulation is closely and invariably observed. The offence is one the commission of which may be so easily detected that it is hardly a probable one for men to be betrayed into. Moreover, it is inconceivable that an experienced powder-hand like Goodchild, himself a non-smoker, would tolerate so fearfully dangerous a practice on the part of his companion. If it be said that Baker may have smoked in the watch house or taken his pipe imperfectly extinguished in his pocket to the press house, the answer would be that, independently of the testimony of the men that smoking never takes place in the watch house, the evidence, as far as it goes, tends to establish that the deceased were dressed in proper powder clothes without any pockets.

11.—*Lucifer Match.*

Lucifer match.

Mr. Sharp's 5th Special Rule enjoins that "before going into any danger building or "powder boat, the men are to change their clothes and boots and put on their working "dress (made without pockets or metal buttons"). When the factory was inspected by myself in June 1877, and by Major Ford in November 1878, we looked particularly to this point, and in no case did we find a man with a pocket in his clothing.† Since the accident, all the ordinary day clothing of the deceased has been discovered amid the ruins of the changing room, showing that they had put on their working clothes, and it would be a straining of probabilities under these circumstances to assume that the working clothes so worn had pockets in them. I think the presumption is very strongly and decidedly in favour of the clothing having been all correct in this particular.‡ But having said this much, I feel constrained to express my opinion that the practice of the factory in regard to this important matter is not satisfactory. The men are not, as in several other factories, provided with working clothes; they find their own, using for the purpose any old clothes which they may have at hand, and either cutting out the pockets or sewing them up. The clothes so worn are changed in the changing room. "Occasionally" Mr. Sharp, or his son, or the manager, examines the men to see that their working clothing is in conformity with the special rule. This system falls short, in my judgment, of providing the full measure of security which is attainable in respect of

Necessity for more stringent regulations as to clothing.

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* The possible connexion of the accident with the machinery has been discussed at pp. 9, 10.

† I found some cases of metal (brass) buttons, contrary to the rule, and Major Ford found a woman in the packing house with pockets, but I believe it was not understood, until we called attention to those points, that *brass* buttons were intended (as they certainly were) to be prohibited, or that the regulation as to pockets extended to women in the packing room. These points have since been rectified.

‡ The clothing worn by the men at the time was destroyed by the explosion.

this important point. I will not go so far as to say that I consider it indispensable that the occupiers should provide the working suits, though I am of opinion that it is very *desirable* that they should do so, as rendering the enforcement of this regulation more easy and regular. But I do think that it is indispensable,—

1st. That there should be some one personally responsible for seeing that the men every time they go to work have clothes such as the regulation enjoins;* and—

2nd. Where the men provide their own working clothes, that before any article of clothing is so taken into use, it should be submitted to the approval of some responsible person, passed by him, and marked in some distinguishing manner.

Of course, working clothes wear out in time, and have to be renewed. The man accordingly withdraws the article so worn out, and if he is not inspected daily, there is no absolute security that he will not (perhaps through inadvertence), replace it with an article having pockets; or, the sewing up of a pocket may become undone. Both of these things have happened more than once within my official experience. Neither of them would be possible if the two precautions which I have suggested be adopted, the latter precaution being, moreover, recommended by the importance of preventing the men from going home in their powder clothes, and so running the risk of being burnt to death by a spark igniting their powder-begrimed clothing.†

As regards matches possibly left lying about, the matches supplied for the lighting of the watch house fire are safety matches. The watch house fire was on this occasion lit by Edwards. There is a certain remaining risk due to the possible presence of a match which may have been dropped by some trespasser in the unguarded unfenced factory, during the non-working hours. I have already dealt with the question of making better provision on this point.

Although, therefore the *possibility* of the accident having been caused by a lucifer match is not one which can be confidently dismissed altegether, it is not one to which I am disposed to assign a high degree of probability.

12.—*Presence of foreign Substances, such as small Stones, gritty Particles, Articles of Metal, Nuts, Bolts, Nails, &c.*

Foreign substances.

We have here what I think must be regarded as a very fruitful and extensive source of risk. I have already in this report referred to the great difficulty which exists in regard to the invariable exclusion of dangerous articles and gritty particles, even where the precautions taken are of the highest order, and I have stated some of the experiences of the Government factories in regard to this matter. But at Chilworth it is impossible for me, consistently with the faithful discharge of my duty, to say that the precautions in regard to the exclusion of grit, have been of the highest order. On the contrary, it will be necessary for me to show that in some respects they were decidedly defective. Thus, it does not appear to me that the "clean" floor or "clean" platform system is so strictly worked as it might be. Some of the platforms external to the buildings (*e.g.*, at the mixing house) are almost flush with the surrounding gravel, and are thus exposed to the contact of grit upon their so called "clean" surfaces. Again, in some instances (*e.g.*, at the mixing house) the masonry portion over and abutting against the external "clean" platform is not itself, faced or fended in any way, so that grit is liable to become detached therefrom on to the platform. Again, the boat in approaching the press passes under a very low brick-work bridge, from the uncovered masonry of which considerable gritty particles are liable to become detached, with (as I ascertained by actual experiment) comparative ease, and these falling on to the "clean" boats (if not into the ingredients themselves)‡ may then be conveyed by the barrels into the press house.§ These undoubtedly are specially weak points in the Chilworth system, sources of grit, quite irrespective of those sources which arise from such occasional failures as may occur in the working of even the most perfect system. And at Chilworth the elements of risk have, I regret

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* In Messrs. Curtis's and Harvey's factories the very excellent plan of requiring a foreman or leading hand to certify daily in writing that he has so examined the men is adopted.

† As actually happened some years ago at this factory. Mr. Sharp's rules imperatively prohibit the working clothes being taken home (special rule 5), but unless the clothing is distinguished in some particular manner, a man going home in his working clothes may easily escape notice.

‡ The ingredients are covered with a tarpaulin (which on the morning of the accident, on account of the rain, would certainly not be likely to be dispensed with), but the boat itself is uncovered.

§ It is proper to remark that Bish stated that in his experience (of about 15 months) he had not known an instance of grit so falling, but I venture to think that grit might very easily fall without his observing it.

to say, been unnecessarily and not inconsiderably aggravated by the practice which there prevailed, and to which Major Ford called Mr. Sharp's personal attention in November last, of allowing the semi-worked gunpowder to fall upon the floors, thence to be swept up and reworked.

The summary of sources whence foreign substances may be accidentally derived are indicated in the summary of possible risks already set forth. For example, there is the possible introduction of grit, or small pebbles, through the failure to observe strictly the regulations as to the use of proper shoes (Special Rule No. 6), or the very salutary regulation forbidding the turning up of the trowsers at the bottom (Special Rule No. 5); or the tools may have been laid momentarily where they might take up grit, or the cotton waste may not have been so vigilantly picked over as to ensure the removal of metal fragments* (Special Rule 12); or a metal bolt or nail or other similar substance may have fallen into the ingredients after mixing from the roof of a building or from a machine;† or by the action of the wind, or otherwise, grit may have been conveyed into the ingredients, or the ingredients themselves may have been imperfectly sifted originally. These are all so many possible openings for the introduction of hard foreign substances such as would be sources of real and formidable risk in a machine in which powder was being subjected to any strong grinding, crushing, pressing, or percussion. I have therefore diligently and at considerable length investigated the probabilities of the existence of these particular risks in this instance. The result of my inquiry is to show that, except in the three particulars above mentioned, viz., the want of a clear definition and boundary to the "clean" platform, the presence of unfended masonry over the "clean" platform, and the passage of the boat under unlined brick bridges, no *special* sources of risk existed under this head at Chilworth. But these exceptions are not inconsiderable; while the range of possibility covered by the other suggested "possible" sources of entry of foreign substances are so numerous as to constitute this group of risks one to which a high degree of suspicion must attach, where the accident as in this case appears to be connected with a machine which, like a "breaking down" or granulating machine, involves considerable crushing and friction of the powder.

Here again, however, my conclusions must stop short at suspicion more or less strong; but here again, as in the other instances in this factory in which it appears to me that the avenues of dangerous approach have not been sufficiently guarded, I feel bound, without reference to whether this particular accident did or did not arise from this cause, to express my opinion that improvement in certain particulars is possible and very desirable.

I have now examined the various possible causes or elements of risk which exist in cases of this sort, and I have done so somewhat at length, because this is the first serious case of explosion in a press house which has occurred since I took up the duty of Inspector in 1871. I have enumerated and considered a number of possible causes only to dismiss them, because I believe it may be useful to the trade to have placed before them in a synoptical form all the risks which present themselves as possible of occurrence under ordinary circumstances in a gunpowder factory. If manufacturers will take those risks seriatim, and consider attentively how far their system is calculated effectually to guard against them, much will have been accomplished in the direction of the safe working of factories of this class.

Conclusion as to most probable cause of accident.

On a review of all the circumstances, I am disposed to consider that the following directions are those in which the true explanation of this accident is most *probably* to be found, these being the directions in which either the most active and formidable risks appear naturally to exist, or in which the precautionary regulations of the factory appear to have been most defective:

(1.) The presence of some foreign substance, whether of metal or stone, in the breaking-down machine; or

(2.) Fracture or other failure of the breaking-down machine; or

(3.) Fire conveyed to the building from the watch-house fire on the clothing of Alfred Baker.

As I told the coroner's jury it is, however, quite impossible to say that the accident was really due to any one particular cause. The case is one in which it is impossible to do more than by a process of patient elimination reduce the possible causes to a

* I found that the engine men were in the habit of keeping the cotton waste for issue to the danger buildings in a box with a quantity of iron nails, screws, &c. I am of opinion that this is decidedly objectionable.

† The roofs of all the buildings through which this powder passed have been carefully examined, and I am assured that no trace of any missing metal article can be discovered.

Verdict of the jury.

sm all group of the more probable explanations, and this group is represented in my judgment by the three causes which I have enumerated. Under these circumstances the verdict of the jury was a very proper one, viz., that the deceased "met their deaths "by an explosion of gunpowder in a press house, but that the cause of the accident "had not been proved."

Points in which the system of the factory calls for improvement

The jury also expressed an opinion that the precautions adopted in the factory for the prevention of accidents and the securing the safety of the workpeople left nothing to be desired. From the remarks which I have already made as to certain weak points in the system of the factory it will be understood that I am unable to share the complete satisfaction of the jury with the arrangements. I am not in a position to prove, nor do I wish to be deemed to express an opinion to that effect, that the accident actually resulted from any defect in the system; I also consider, and I so expressed myself to the jury, that in the main points the arrangements of the factory for securing safety are generally good. But it is one thing to say this, and another to say that they cannot be improved; and I am decidedly of opinion that one result of this inquiry has been to establish that in the following directions the working of the factory admits of, indeed, calls for considerable improvement, some of the points being matters, moreover, on which the provisions of the Act render changes imperative:—

(1.) Proper provision requires to be made by means either of a fence or of permanent watchmen to exclude unauthorised persons from the factory when the workpeople are absent.

(2.) The work-people should be forbidden to take their meals anywhere but in the watch house or other non-danger building, and it would be well to provide, if possible, against their entering in their powder clothes any room containing an open grate.

(3.) A regular system of inspecting the men and their clothing, with a view to the strict and uniform enforcement of the regulations on this head, should be established,

(4.) A system of periodical overhauling of the machinery by a skilled mechanic should be established.

(5.) Better precautions should be adopted to secure the exclusion of foreign substances, in the following particulars:—

(*a.*) Improvement of the existing "clean" floor and "clean" platform system.

(*b.*) Covering all masonry which overhangs or abuts against a "clean" platform.

(*c.*) Lining all masonry bridges under which "clean" boats and powder pass, or providing covered boats.

(*d.*) Abandoning the system of allowing the semi-manufactured powder to fall on to the floors of the working buildings, and to be placed therefrom into the machines.

(*e.*) Providing a proper place free from loose iron, nails, &c. for the keeping of clean cotton waste.

I have already stated that I believe Mr. Sharp to be most anxious to adopt all such precautions as are likely to contribute to the safety of his factory, and I have little doubt that when the foregoing matters are placed formally before him, as it will be my duty to do, he will readily effect such alterations as may be practicable with a view to remedying the several defects.

In conclusion, I have much pleasure in placing on record the fact that from Mr. Sharp, his sons, and his manager, I received the fullest assistance in carrying out my inquiry, and I am much indebted to them for the ready and courteous manner in which they afforded me such information as I desired.

I have the honour to be,
Sir,
Your obedient Servant,
V. D. Majendie, Major R.A.,
H.M.'s Chief Inspector of Explosives.

The Right Hon.
the Secretary of State,
Home Department.

LONDON:
Printed by George E. Eyre and William Spottiswoode,
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For Her Majesty's Stationery Office.

8.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending an Explosion of Gunpowder in the Extracting House of the Gunpowder Factory of Messrs. Pigou, Wilks, & Laurence (Limited), at Dartford, on the 11th March 1879;

BY

MAJOR V. D. MAJENDIE, R.A.,

H.M. CHIEF INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, March 31st, 1879.

I HAVE the honour to report that in obedience to your Order of the 19th March 1879, (H O. $\frac{50358}{79}$), made under the 66th section of the Explosives Act, 1875, I have held an inquiry into the circumstances attending an explosion of gunpowder which occurred on the 11th instant, in the extracting house of the Gunpowder Factory belonging to Messrs. Pigou, Wilks, & Laurence (Limited), whereby a boy was severely burnt, a man sustained slight injury and a horse was killed. The building in which the accident happened was also damaged.

In accordance with the provisions of the above-mentioned section of the Act, I beg to furnish the following Report:—

Circumstances of accident.

The Dartford Gunpowder Factory is carried on under a Continuing Certificate (No. 53, dated 7th October 1876) and an Amending License (No. 17, dated 21st December 1876). The building in which the accident occurred is marked "44, Extracting House" on the plan attached to the Amending License. The building is built of wood on three sides, and of brick (with cemented lining) on the fourth side. It is provided with a slated (unlined) roof, and a brick floor. It is not in any way treated or fitted as a "danger building," a point on which I shall hereafter have to remark more particularly.

In this building the operation of extracting the saltpetre from damaged powder and from the sweepings of the various powder-houses is carried on, the operation being performed about once a week. The process of extraction may be described as consisting essentially in the boiling of the powder in a large quantity of water, and then passing the solution through filters into the evaporating pans, whence the saltpetre which is obtained is filtered, crystallised, and collected, the processes at this stage consisting in substance of those which are applied in the original refining of the saltpetre. The amount of saltpetre which can be obtained by extraction is estimated at about 94 °/₀ of the whole.* In the Dartford extracting house there is provided the following apparatus: 1st, a large circular iron "quenching" pan, about $5\frac{1}{2}$ feet internal diameter, and about 3 feet deep, and having a capacity of about 300 gallons; 2nd, two circular iron pans or boiling pots, of about the same dimensions as the "quenching" pan above named. These two boiling pots stand side by side and are set in brickwork, the flue by means of which they are heated passing round them, and the fires for heating them being outside the building, and separated from it by the brick wall, which, as already stated, forms one side of the building. A circular flat iron plate connected

* A Handbook of the Manufacture and Proof of Gunpowder, p. 6. By (the late) Capt. Smith, R.A. London. Printed for Her Majesty's Stationery Office.

[C.—2304.] *Price ½d.*

the top of each pot with the top of the brickwork setting. The plate had the appearance of a flange from the pot, turned over the brick wall, but as a matter of fact it did not form part of the pot at all, but was cemented to it and to the brickwork on which it lay. Underneath the plate there was a brickwork "safeing" over the flue of nearly a foot in thickness.

The instructions to the men who were charged with the work were unfortunately not in writing, but it is not disputed by those employed that they were to the following effect: All powder brought to the house was to be at once drowned or "quenched" in the quenching pan, and thence transferred wet to the boiling pots.

On the present occasion, at about 10.30 a.m, ten tubs of powder sweepings, containing about 50 lbs. each, had been brought to the door of the extracting house in one of the covered charge carts usually employed in the factory, from the expense magazine, where it had been collected from the dusting-house, glazing-house, &c. The cart was backed against the front door of the house, and a lad named Thomas Berrecloth was engaged in handing out the tubs as the men inside were ready to receive them. The following men were engaged in the house:—Samuel Bonnick, foreman of mills, George Ellis, carter, and a man called Martin, who commonly worked in this house.

With the exception of Martin, all the workpeople present wore their regular powder clothes (as supplied by the Firm); the boy in the cart wore his powder shoes. Martin wore his ordinary clothing, he not being regarded as a powder hand, and the house, as already stated, not being treated as a danger building.

It is admitted that the instructions laid down for the conduct of the work were not attended to. Bonnick states that he asked Martin—whom, he says, he regarded as responsible for the work—where he should place the sweepings as they were handed out of the cart. Martin told him to put part of them into the boiling pot No. 1, and part into the quenching pot. As already stated, the instructions required that the powder on being received should be *all* placed in the quenching pot. Bonnick admits that he was aware of this instruction, but he says that Martin justified the departure therefrom by the fact that the fire under the boiling pot had only been lighted a few minutes, and the water therein was scarcely lukewarm. So Bonnick and Ellis emptied successively the contents of five tubs into the boiling pot No. 1, Martin stirring it the while with a large implement, so as to place the powder actually under the water. They then proceeded to empty some tubs into the quenching pan, and they had just shot two tubs into this pan, and Martin was engaged in stirring and drenching it, and they all had their backs towards the boiling pots, when smoke and a slight fizzing suddenly issued from the boiling pot No. 1, and the three men rushed from the house, Bonnick with the back of his clothing on fire.

Effects of explosion.

The men had hardly escaped when there was a sharp explosion at the quenching pan, the boy jumped out of the cart, and almost directly afterwards the three tubs of sweepings which still remained in the cart exploded with considerable violence, blowing the cart to pieces, so injuring the horse that he had to be destroyed, and inflicting severe burns on the boy. Miller appears to have been slightly injured by falling or being thrown down. The explosion in the house was sufficiently powerful to dislodge the greater part of the slates from the roof, to shift one of the wooden sides slightly outwards from the foundation, and to break a little of the woodwork. The iron plate, which formed the joint between the top of the boiling pot No. 1 and the brick setting, appeared to have been slightly shifted. The explosion of the cart broke a few windows at from 15 to 50 yards (in the composition-house and the manager's house). At my request the manager caused the joint plate of the boiling pot No. 1 to be removed, when, as I expected, the cause of the accident at once became apparent. It appeared that the brick "safeing" over the flue and underneath the joint plate had from some cause or another disappeared for a length of about 12″ to 16″. Apparently, the bricks had been removed, and as this defect existed exactly over that portion of the flue where the brickwork was periodically removed for the purpose of cleansing the flue, it may be conjectured either that the opening of the masonry at this part had caused some of the bricks to give way, or that the workmen had removed and omitted to replace them. However this may be, it is certain that the brick "safeing" to this extent had disappeared. Thus, there was nothing to exclude the powder dust from the flue or to prevent the fire in the flue from reaching the powder dust which might fall on to the upper part of the pot, except the cement by which the iron plate was jointed to the pot and brickwork. An examination of this cement at once disclosed the fact that opposite to the part where, owing to the brick "safeing" having disappeared, the flue

was open, the cement had become corroded and defective to an extent which sufficed to admit of the ready passage of powder dust and fire. Moreover, there were evident marks of powder having been recently burnt in the interstices and openings in this defective joint.

Conclusion as to cause of accident.

The accident is thus easily explained. Some of the powder dust from the sweepings became ignited in or at the defective joint by fire from the exposed flue, other powder dust lying about the pot, and possibly some which had been imperfectly drowned and was floating on the water were next ignited, and the ignition thus established communicated to the powder in, on, and about the quenching pan, the explosion of which ignited the three tubs of sweepings in the cart.

Accident caused by disobedience of regulations.

It is also evident that the accident was entirely due to a disregard of the instructions, for which act of disobedience I consider both Bonnick and Martin are to blame. The larger share of blame must rest upon Bonnick, who being in the position of a foreman should not have acceded to the suggestion of a workman (Martin) to disobey what he admits he knew to be the regulations. Bonnick endeavours to shelter himself by the plea that he did not consider himself really responsible for the work; he regarded Martin, he says, as responsible, he being the man who generally did this work. But this plea will not avail in the face of the fact that Bonnick occupied the position of a foreman and must have known perfectly well that he was not subject to orders from his subordinate, and that he was in fact the person in charge. I consider that by thus transgressing orders, whether by deliberate intention or by a weak compliance with a suggestion of Martin's, Bonnick has shown himself to be unqualified for any position of trust and responsibility in a gunpowder factory.

Martin is also in my judgment to blame, for he was in the habit of working in this house, he was familiar with the regulations, and he yet took upon himself to suggest to a man who was less familiar with the work than himself that on this occasion these regulations might be safely and properly disregarded.

Necessity of enforcing strict discipline in gunpowder factories.

This accident affords another illustration of the absolute necessity of insisting upon the strictest discipline, even in matters of the most minute observance, in a gunpowder factory. If the men are to consider themselves at liberty to depart from the regulations at their discretion, still more if men in a position of trust and responsibility, like Bonnick, are to lend the sanction of their authority to such acts of disobedience, it is inevitable that accidents should take place, and the integrity of the whole system of precautions becomes compromised.

Proportion of blame attaching to the Company.

The Company themselves are not in my judgment wholly free from blame in this matter. In the first place, assuming the regulations which they had laid down for this house to be necessary and proper, it is clear that they ought to have embodied them in a "Special Rule," which should, in accordance with the 11th section of the Act,* have been submitted for the approval of the Secretary of State.

Arrangements for extracting, defective.

In the next place, the arrangements in regard to the process of extracting appear to me to have been seriously defective. It is the practice at Waltham Abbey carefully to wet all the powder *before* bringing it to the extracting-house, and the plan of carrying out the wetting in the same building is in my judgment open to obvious and considerable objection.

Neglect of precautions enjoined by Act for danger buildings.

Finally, even assuming that the plan was not objectionable, it would still be incumbent on the Company to treat this house as a "danger building." Section 10 § (2) defines a "danger building" as one "in which any process of the manufacture is carried on, or in which gunpowder or any ingredients thereof, either mixed or partially mixed, are kept, or in the course of manufacture, are liable to be;" and section 105 directs that "any person who carries on any of the following processes, namely, the process of dividing into its component parts or otherwise breaking up or unmaking any explosive . . . . . shall be subject to the provisions of this Act as if he manufactured an explosive, and the expression 'manufacture' shall in this Act be construed accordingly."

It therefore appears abundantly clear that by the terms of the Act this building is a "danger building," and subject therefore to all the regulations applicable to such buildings. But, as already stated, it was not so treated by the Company, and by this

* "Every occupier of a gunpowder factory . . . . . shall, with the sanction of the Secretary of State, make special rules for the regulation of the persons managing or employed in or about such factory . . . . . with a view to secure the observance of this Act therein, and the safety and proper discipline of the said persons and the safety of the public." Section 11.

neglect they have unquestionably transgressed the law. I have directed the attention of the Company to these points, and they are now making new arrangements for the carrying on of the process of extraction, by which the defects above remarked upon will be remedied.

I have the honour to be,
Sir,
Your obedient Servant,
V. D. Majendie, Major R.A.,
H.M.'s Chief Inspector of Explosives.

The Right Hon.
The Secretary of State,
Home Department.

LONDON:
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9.

REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT

ON

The Circumstances attending an Explosion of Gunpowder at a Gunpowder Factory at Elterwater, near Ambleside, Westmoreland, on the 29th November 1878;

BY

MAJOR A. FORD, R.A.,

HER MAJESTY'S INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, 28th December 1878.

I HAVE the honour to report that, in obedience to your Order of the 30th November 1878, under the 66th section of the Explosives Act, 1875 (38 Vict. c. 17), I have made an inquiry into the cause of an accident by explosion which occurred on the 29th ultimo at the Gunpowder Factory of the Elterwater Gunpowder Company, situated at Elterwater, near Ambleside, by which three men were killed and one was injured.

I also attended the adjourned inquest on the deceased, which was held by Mr. Thompson, the coroner for the county of Westmoreland, at Elterwater on the 6th December.

In accordance with the provisions of the above-mentioned section of the Act I beg to render the following Report:— Site of accident.

The factory in which the accident occurred has existed since the year 1824, when it was licensed for the manufacture of gunpowder by the Justices in Quarter Sessions at Kendal,* under the Act of George the Third (12 George III. c. 61). The Elterwater Gunpowder Company, Limited, are the present proprietors, and when the Explosives Act, 1875, came into force they applied for and obtained a "Continuing Certificate"; in virtue of the Continuing Certificate they are entitled to carry on the manufacture of gunpowder in the factory as it existed on the 1st January 1875, subject to the regulations which form part of the terms of the Continuing Certificate, and which were, in fact, the regulations in force under the previous Act (23 & 24 Vict. c. 139). In addition to the above regulations, the factory is also subject to the provisions of the General Rules for gunpowder factories contained in the existing Act,† and the occupiers are also required, with the sanction of the Secretary of State, to make Special Rules for the regulation of the persons managing or employed in or about the factory.

The building in which the explosion now under notice happened was the corning-house, in which the gunpowder after being pressed into "press-cake," as it is technically called, is formed into grains of the required size, either by "corning" or "granulating." The only regulation imported from previous Acts which affects the work in this building is one limiting at one time the quantity of gunpowder to be corned or granulated to twelve hundredweight, and the total quantity of gunpowder in the building to twenty-four hundredweight; but by the General Rules under the Explosives Act, (1) the interior of the building, and the benches, shelves, and fittings therein (other than machinery) are to be so constructed, or so lined or covered, as to prevent the exposure of any iron or steel in such manner, and the detaching of any grit, iron, steel, or similar substance in

* The original license bears date the 16th January 1824.

† Section 10.

such manner, as to come into contact with the gunpowder or ingredients thereof in the building, and the interior, benches, shelves, and fittings are to be, so far as is reasonably practicable, kept free from grit and otherwise clean; (2) oiled cotton, oiled rags, and oiled waste, and any articles whatever liable to spontaneous ignition, are not to be taken into the building except for the purpose of immediate use therein, and upon the cessation of such use are to be forthwith removed; (3) repairs are not to be done to or in any room in, or other part of the building until, so far as practicable, all gunpowder is removed, and the room or part is thoroughly washed out, and if any repairs are necessary while gunpowder is unavoidably within the building, then the tools and implements used therefor are to be made of wood, or copper, or brass, or some soft metal or material, or are to be covered with some safe and suitable material; (4) the General and Special Rules, and the quantity of gunpowder allowed in the building, and the name of the building, or words indicating the purpose for which it is used, are to be constantly kept affixed either outside or inside in such manner as to be easily read; (5) due provision must be made by the use of suitable working clothes without pockets, suitable shoes, searching and otherwise, or by some of such means for preventing the introduction into the building of fire, lucifer matches, or any substance or article likely to cause explosion or fire, and for preventing the introduction of any iron, steel, or grit into any part of the building where it would be likely to come into contact with gunpowder; (6) a person under the age of 16 years is not to be employed in or enter the building except in the presence of and the supervision of some grown-up person; (7) the gunpowder in course of manufacture in the building must be removed therefrom with all due diligence so soon as the process connected therewith which is carried on in the building is completed, and is to be loaded and unloaded with all due diligence. The Special Rules* require every person to put on the working clothes without pockets before commencing work in the building, and before leaving the factory to resume his ordinary clothes; and to put on the proper shoes provided for the purpose before stepping on to the platform or gangway leading to the building.

The site where the corning-house stood is shown in the accompanying photographs, which were taken on the 5th of December.† The corning-house was a two-storeyed stone building with a slated roof standing by the side of a small brook, the upper storey containing two machines for corning the gunpowder and separating the grains into the sizes required respectively, and the lower storey the toothed wheels and gearing connecting them with a water-wheel at the side by which they were driven. The ground is very irregular and rises on each side of the brook; the upper storey was thus entered from the natural level at the farther side, and it was unnecessary for the men working in it to pass through the lower storey. A small stream of water falling from the higher to the lower level and running thence into the brook served to turn the water-wheel. A building stood on either side of the corning-house, one (on the right, as seen in the photographs) being separated from it by the water-wheel, and the other (on the left) really forming part of the same building but without any intervening door. At the time of the accident the former building was used for keeping spare sieves for the corning and separating machines, and had unlined stone walls; the latter building, which was formerly a glazing-house, was not in use.

It will be seen from the photographs that while the destruction of the corning-house and of the wall separating it from the disused glazing-house was very complete, the glazing-house itself (on the left in the photographs) was not much injured, the wooden roof having been merely lifted off; while the building used for keeping the sieves (on the right), with the exception of a little damage to the roof, was structurally uninjured. Indeed, in a window on the farther side there was not a pane of glass broken. These are evidences of the small quantity of gunpowder in the building at the time. From careful inquiries as to the amount of press-cake taken into and of corned powder and dust taken out of the corning-house during the day, I am able to estimate with tolerable accuracy, that the amount of gunpowder which exploded was only about 500 lbs. Slates and pieces of wood were projected to a distance of about 50 to 60 yards, and a man named Matthew Walker, passing with others at the time about 39 yards off, was badly injured in the head by a slate with which he was struck. With the exception of the houses adjoining, no structural damage was done to any other building in the factory: thus, a house for mending sieves, distant 28 yards and screened by the trees, was uninjured; five panes of glass only were broken in another building also screened by trees at 50 yards; a small wooden house partially screened by trees at 35 yards was also uninjured;

* The Special Rules for this factory were sanctioned by the Secretary of State on the 24th October 1876.

† It has not been considered necessary to have these photographs copied for the purposes of the printed report.

the press-house, distant about 50 yards and screened by the disused glazing-house and a mound, was altogether untouched.

The machine in the corning-house, used for breaking the press-cake into grains, was one of the old-fashioned corning machines, consisting of a frame of wood suspended by ropes from the ceiling, and made to oscillate by means of a perpendicular crank passing through the floor. In this machine a number of wooden sieves lined with copper and containing pieces of press-cake and round blocks of *lignum vitæ* placed upon the frame are shaken violently by the motion of the crank, and the blocks dashing about in the sieves soon reduce the press-cake to fragments and dust, which pass through the sieves on to the floor. The grain and dust are transferred by hand to the separating machine, of a similar character, with wooden sieves like the former, but used only for separating the grains from the dust without blocks of *lignum vitæ*. The dust which fell on to the floor under this machine was taken back to the press-house to be re-pressed, and the corned powder was removed to undergo the next process, viz., that of glazing.

Bearing in mind that a temperature of about 560° Fah. only (viz., the inflaming point of sulphur) is sufficient to fire gunpowder, and that a primitive method of obtaining fire (probably not less than about 1000° Fah.) was by rubbing two pieces of wood together, the dangerous character of the old corning machine must be apparent to every one. The whole manufacture of gunpowder, indeed, as carried on a century ago consisted of a series of very hazardous operations from first to last; and although much has been done in the way of improvement of late years, still in the older factories, in which many of the workmen have, so to speak, grown up amid the danger and become so familiar therewith as scarcely to recognize it, there has been a disinclination to make any change which might bring them into another class of dangers, of the nature and degree of which they are ignorant. The general immunity from accident has, however, on the whole, been marvellous, and is I think mainly to be accounted for by the recognition of the risk on the part of the workmen, and their great care to prevent an explosion therefrom. Thus it will scarcely be now believed by those unacquainted with the manufacture, that the old method of drying gunpowder was in a room containing a metal dome heated by a fire underneath; and although the present method of drying by means of steam pipes has long been in use, the old "gloom" stoves (as they were called) were not entirely done away with until about three years ago.* So with regard to the old corning machines; the last in use in the Government Factory at Waltham Abbey† was destroyed by an explosion in 1843, and it is not until 35 years afterwards that the last (as far as I am aware) in the private factories now disappears by the same cause.‡ The new method of granulating by passing the press-cake between revolving gun-metal rollers is a much safer method, and if the "machinery" connected therewith is not of exposed iron, and is kept in good order, and care is taken to avoid accidents in removing incrustations of gunpowder from the teeth of the rollers,§ there ought to be little liability to explosions therewith, provided that grit is carefully excluded from the building and from the powder in the processes through which it previously passes. Owing, however, to the great difficulty of an absolute exclusion of grit and fragments of stone and iron both from the ingredients‖ and from the semi-manufactured powder in those former processes, the manufacture of gunpowder must always be more or less hazardous, and of all the operations that in which it undergoes more crushing and grinding than in any other, viz., the process of granulation, will be the most so, excepting always the process of incorporation of the ingredients.

The only exposed iron in the building at the time of the explosion, as far as I could determine, was the upright crank in each machine, which being "machinery" was exempted by the provision of the general rule above quoted; the nuts for holding the machine together were, it was stated, covered with leather. The factory was last inspected on the 23rd May in the present year by Major Majendie, who then found that in this particular building plaster containing grit was readily detached from the walls,

* I believe there is still a gloom stove in existence in Cornwall, but it is no longer in use.

† See Handbook of the Manufacture and Proof of Gunpowder, by the late Captain Smith, R.A., p. 57.

‡ The Act of George III. (12 George III. c. 61) was the first statute regulating the manufacture of gunpowder. By it the dangerous practice of incorporating the ingredients by means of a pestle and mortar was forbidden, but even certain factories in Sussex were exempted so far as the manufacture of the sporting powder, known as "Battle" powder, was concerned.

§ An explosion by which two lives were lost was thus caused at Herodsfoot Factory, near Liskeard, on 14th October 1876.

‖ A general rule in the Explosives Act, 1875, requires that all ingredients to be made or mixed into gunpowder shall before being so made or mixed be carefully sifted for the purpose of removing therefrom, so far as practicable, all dangerous foreign matter. Section 10 (13).

the paper used as the lining having peeled off in parts. The same was found also to be the case in other buildings, and a prosecution was instituted against the proprietors for these and other breaches of the law, a conviction being obtained in each case. I am glad, however, to be enabled to report that at the time at which the explosion took place this defect of insufficient lining had been remedied in the part of the building in which the machines stood, and there was no longer any cause of complaint in this respect, as the building had been subsequently lined throughout with a kind of brattice cloth, which, judging by the appearance of the press-house, also similarly lined, would have effectually prevented the further detachment of grit from the walls and roof. But the same cannot be said of the adjoining building in which the spare sieves were kept, and *any* means by which grit may by any possibility be brought into a corning-house is an element of danger; if the grit falls into a corning sieve it is at once dashed about among gunpowder by the *lignum vitæ* blocks, if on to the floor, and no accident then happens therefrom, it is swept up with the dust, only to go back to the press and re-appear in a corning sieve at some future time: I consider, therefore, that keeping the sieves, which were changed from time to time according to the size of grain required, in an unlined building in which grit was freely detached, and which was not kept technically "clean" in any way, was a very defective arrangement, and one which should have been remedied by the proprietors. Whether, however, any grit by which the explosion may have been ultimately caused was brought in from this sieve-house there is no positive evidence, but as the size of the grain was not altered on that day no general change of the sieves was rendered necessary, only of such (if any) as required repair.

But Major Majendie found another cause of complaint as regards this building when he inspected the factory, viz., he observed a man wheeling into it a barrow without changing his shoes, which were heavy nailed ones, by which means exposed iron and grit would necessarily be brought in. A conviction was also obtained for this offence. Whether this defect had been completely remedied at the time of the explosion I had no means of judging.

Circumstances of accident.

On the morning of the 29th November 1878, the three men, James Lee Barrow, George Gilbanks Clarke, and John Greenop, who were employed in the corning-house, went to their work as usual, having first put on their powder clothes, in accordance with the Special Rule already referred to. At 12 o'clock they suspended their work for the dinner hour and went out of the factory, but without taking off their powder clothes as required by the same rule. This, it appears, was in accordance with their usual custom; in fact, the removal of their powder clothes had never been insisted upon at that time, only on their leaving off work for the day in the evening. On my questioning the foreman as to this point, he said that he understood the words "before leaving the factory" in the rule to mean "before leaving off work for the day;" he did not consider a change of clothes for an absence of an hour necessary, and it never occurred to him that there was any real reason for the men to change then—such as, for instance, the risk to themselves of their clothes saturated with gunpowder dust becoming ignited by a spark when sitting by the fire side in their own houses, or from the ashes falling from a pipe smoked before starting to resume their afternoon work. Nor did he even think it necessary to have them searched on their return to the factory. During the dinner-hour the two millmen appear to have been the only two persons left in the factory, one at the upper mills and the other at the lower mills near the corning-house. The millman at the upper mills passed near the corning-house about 20 minutes before one o'clock, when he came down to assist his mate in removing the charges at the lower mills; during his walk from one end of the factory to the other he noticed no one about the premises. About one o'clock the three men returned to work at the corning-house, and almost immediately afterwards, and before all the men employed in other parts of the factory had passed by, the explosion occurred; two of the three men, all of whom were inside the building at the time, were killed on the spot, and the third (Barrow) survived but a short time. As already stated, the building was entirely destroyed: Barrow was found on the ground floor close to the wall of the building near the corning machine, with his feet held fast by some pieces of timber, and was extricated as soon as the fire could be put out; Greenop was also near the corning machine, but towards the middle of the building, and Clarke was on a part of the walls of the building which had been blown into the brook. All of the three men had on their proper powder shoes, which they had, it may be assumed, put on at the door of the building, as required by the Special Rule, their ordinary boots having been found outside after the explosion.

An attempt was made to elicit from Barrow, who survived for about two hours, some information which might tend to throw a light upon the cause of the explosion, but all that could be learnt from him was that he had oiled the machines just before. The machinery was in the lower storey, and he was in the upper storey when it occurred. From the statements of passers-by, it appears that the machines had only just been started at the time, but at the exact moment no one was nearer to the building than about 39 yards, where Matthew Walker was struck on the head by a slate projected from the roof. There is thus absolutely no evidence as to the cause in this case, and the only way by which we may form even a reasonable conjecture as to what it might have been is, I venture to think, by enumerating all the causes which may suggest themselves as at all possible, and then removing from the list by a process of elimination those which are not so probable as the rest. The range of conjecture may by this means be much narrowed, but a definite solution is impossible, and after all the actual cause must be left as much in obscurity as before. The process proposed has, however, this advantage, that by enumerating possible causes attention may be drawn to what might under altered conditions become real causes, and weak points may thus be brought to light and corrected, and greater immunity from future accidents may be secured. At the inquest I drew the attention of the jury to such causes as suggested themselves to me during the course of my inquiry as possible, but they were not able to select any one in particular as entitled to such a share of probability as would justify them in expressing an opinion that it might have been the true one.

Evidence as to cause of explosion.

Putting, then, out of the question lightning, as it is beyond doubt that there was none on the day when the accident happened; the spontaneous ignition of cotton waste left in the building, as no cotton waste was used in the factory; the heating of the bearings of the machine, as they had only just been started at the time of the explosion; and a spark from a fire, as there was none nearer than the watch-house, which is at a considerable distance, it appears to me that all the possible causes may be included among the following:—

(*a.*) The working of the corning machine—

1. Friction of a *lignum vitæ* block in one of sieves.
2. Presence of grit in the sieves.
3. A *lignum vitæ* block jerked out of a sieve on to the floor.

(*b.*) Accidental incendiarism—

4. One of the three men in the building having brought a lucifer match back with him from dinner about his clothes without his knowledge.
5. One of the same three men having smoked on his way back from dinner and concealed a pipe, which he supposed was extinguished, but was not really so, about his person.
6. Grit brought into the building either by one of the men in changing his shoes carelessly, or by Barrow about his clothes from the part of the building containing the machinery (which he had oiled just before).
7. A man passing by the building smoking and igniting the powder dust outside by a spark from his pipe.

(*c.*) Wilful incendiarism—

8. A person having thrown heads of lucifer matches, amorces, or other similar articles into the building while the workmen were away during the dinner hour.
9. A man passing by wilfully firing the building by dropping a lighted match near some powder dust outside, or in a similar way.
10. One of the three men in the building blowing it up intentionally in a state of intoxication, or in order to commit suicide.

(*a.*) With regard to the three causes which may be attributed to the working of the corning machine, although sufficient heat to fire gunpowder might be generated by a very hard piece of wood striking with force against copper, yet an explosion would be more likely to be caused in this way after the machine had been working for some time, when the temperature of the block and sieve would be somewhat raised, than when it was first started; but if grit—whether brought into the building in one of the sieves from the unlined house in which the sieves were kept, or in the press-cake from the press-house—happens to be present, we have a substance which is harder than any metal rubbed with considerable force between the wood and the copper, and all the time in contact with the dust of the gunpowder. To fire gunpowder under these conditions cannot be difficult, nor is a continued motion of the sieve necessary to generate the heat required. It must not be forgotten that heat in a visible form is not

needed, but only such a moderate temperature as will inflame sulphur—one of the ingredients of the gunpowder; this temperature the friction of *lignum vitæ*, copper, and grit against one another would comparatively soon produce, and the sieves should certainly, as I have already stated, not have been kept in a building where grit could by any possibility have got into them. Again, it is not unlikely that a machine such as described should on starting give a jerk by which a block might be thrown out of one of the sieves containing, possibly, too much press-cake. Two blocks weighing 4½ lbs. and 6½ lbs. respectively were used in each sieve, and either of them if thrown violently on to the floor might, perhaps, fire powder dust lying on it, more particularly if grit happened to be present on the floor also.

(*b.*) The case of a man taking in matches about his person is not altogether an impossible one, though perhaps not very probable, but that, as well as the next supposed case, would have been removed from the list of possibilities had the system of changing the working clothes enjoined by the Special Rule been carried out. It is unintelligible how such a state of things could have existed as a foreman permitting the men day by day to disregard so important a rule, and the manager all the while in ignorance that they were doing so. All three of these men were known to smoke, and even the precaution of searching them on their return was not adopted. With regard to the sixth supposed cause there is nothing to show whether the building was free from grit or not, and it may, I venture to think, be assumed that it would not be likely that one of the men passed through the factory smoking, although of course it would, in the absence of supervision, be quite possible for him to do so. Smoking is prohibited in the factory except by the night watchman within the watch-house.

(*c.*) With regard to the first of the suggested possible causes by wilful incendiarism, there were two millmen in the factory during the dinner hour, one at the lower and the other at the upper watch-house. At about 20 minutes to one the latter walked through the factory to join his mate (in order to remove the mill charges with him at one o'clock), and passed near the corning-house. He observed no one on the premises. The factory, however, is not enclosed by a fence, and it would be very easy for anyone to get into the part where the corning-house stood unperceived by the millman. The building, it appears, was locked up while the men were away, but the key was left over the door; any person who knew where it was might have thrown matches inside. I made inquiries as to whether there was any discontent among the men, and found that although several of the powder and other hands were under notice to leave owing to the depression of trade, and those remaining behind were to have their wages reduced, no bad feeling had been shown by any of them. The three men in the corning-house were to have remained at the factory. There was nothing whatever to show that the explosion had been thus maliciously caused. The next supposed case, viz., that of a man wilfully firing the building from the outside, is in the highest degree improbable; and with respect to the last the same may also be said, as the men were all steady sober men who had been employed for many years on the works, and there was not a tittle of evidence that either of them was in the slightest degree intoxicated.

The position now arrived at by the above process may be thus shortly stated: if the explosion was caused by the working of the corning machine, *probably* it was due to grit in one of the sieves, or a block being jerked out of a sieve on to the floor; if it was caused by accidental incendiarism, it was *probably* due to either a lucifer match, a pipe, or grit brought in by one of the three men; if it was a case of wilful incendiarism, something dangerous was *probably* put into the building. If the supposition that it was wilfully caused be excluded, the verdict of the jury would very rightly be one of "accidental death," which was the verdict they arrived at, and in the absence of any evidence whatever pointing to such a terrible crime I quite agree with it. As to the actual cause they could express no opinion, and it will, there is little doubt, for ever remain in obscurity.

One lesson at any rate may be learnt from this accident, viz., that active supervision in matters of detail of foremen in gunpowder factories cannot be dispensed with; such a system as was found to be in force at this factory ought to be impossible. The foreman was severely censured by the coroner, and in my opinion the censure was most fully deserved; but better supervision on the part of the manager would have ensured the observance of the Special Rule, which was, as it appears, habitually disregarded.

It also appears that where access can be obtained to a factory during the absence of the men it would certainly be advisable not to leave the keys of the powder buildings where anyone who has been employed about the place can obtain them.

Lastly, the great value of trees as a screen to powder buildings is again forcibly illustrated. Large pieces of burning wood are very likely to be caught by tall trees, and even a small branch is sometimes sufficient to stop tiles and slates.

I desire to add that I received every assistance from Mr. Bousfield, the manager at the factory, during my inquiry, and every facility in putting questions to the witnesses at the inquest was afforded me by Mr. Thompson, the coroner.

I have, &c.

A. Ford, Major R.A.,
H.M.'s Inspector of Explosives.

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REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending the Explosion of a Glazing House in Messrs. Hall's Gunpowder Factory at the Marsh, Faversham, on the 21st February 1879;

BY

MAJOR V. D. MAJENDIE, R.A.,

HER MAJESTY'S CHIEF INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, March 17, 1879.

I HAVE the honour to report that in obedience to your Order of the 22nd February 1879, H. O. 53830/13B, made under the 66th section of the Explosives Act, 1875, I have held an inquiry into the circumstances attending the explosion of a glazing house in Messrs. John Hall and Son's gunpowder factory at the Marsh, Faversham, by which one man (Thomas Jones) was killed, and eight persons sustained injury (generally very slight), while very extensive destruction of property was also occasioned.

I also attended the inquest on the body of the deceased, which was held at the Marsh Works on the 22nd February and 4th March by Mr. Harris, one of the coroners for the county of Kent.

In accordance with the provisions of the above-mentioned section of the Act I beg to furnish the following Report:—

Origin, situation, and distribution of the factory.

The "Marsh" gunpowder works forms one of a group of three extensive gunpowder factories situated near Faversham, belonging to Messrs. John Hall and Son, of Faversham, and 79, Cannon Street, London. The works are commonly spoken of as forming a single factory. This is incorrect. The "Marsh," "Oare," and "Home" works are in reality quite distinct, and are situated some little distance from one another. The two former factories are complete in themselves, that is to say, they possess all the necessary buildings for the complete manufacture of gunpowder. The "Home" works consist only of incorporating mills and charge houses, and the "mill cake" made there has to be sent either to the "Marsh" or to "Oare" to be completed. The Faversham gunpowder factories formerly belonged to the Government; they are stated to have been originally established about the latter end of the 16th century,* and are thus among the most ancient gunpowder factories in the kingdom. The factories passed into the occupation of Messrs. John Hall and Sons as tenants in the early part of the present century, and were subsequently sold by the Government to that firm. The "Marsh" works, in which the accident which forms the subject of this Report took place, appear to have been purchased by Messrs. Hall and Son in 1854. They occupy a level tract of country, about 88 acres in extent, to the N. of the town of Faversham, and from 700 yards to half a mile, as the crow flies, from its outskirts.† The ground is completely flat, but what (having regard to the use to which it is put) may be regarded as its natural deficiencies in this respect, have been largely corrected in the case of some of the more important buildings by the erection of immense artificial traverses, while in the case of other of the buildings the considerable distances from each other at which, except in a few instances, they have been placed, and the thick intervening plantations of alder, willow, and other trees, render the distribution of the factory buildings generally not unsatisfactory. A great part of the transport of the factory is effected by means of water, artificial waterways connecting nearly the whole of the more important buildings.

* Handbook of the Manufacture and Proof of Gunpowder, by (the late) Captain Smith, R.A., p. 6. Notes on Gunpowder and Gun-cotton, by Major Wardell, R.A., p. 12.

† The town hall of Faversham (in the centre of the town) is distant 1,033 yards from the southernmost corner of the factory.

The neighbourhood of the factory is not at present very thickly populated. A few cottages, which may be regarded as a sort of continuation of Faversham, and which constitute the little hamlet of Davington, run to within about 280 yards of the southernmost corner of the factory, and on the W. and N.W. the little village of Oare, with its church and parsonage, stands on a hill immediately above the works and distant about 400 yards from their N.W. boundary.*

On the coming into operation of the Explosives Act, 1875, Messrs. Hall and Son applied for and obtained a Continuing Certificate (No. 38, dated 2 June 1876) to constitute the factory a "lawfully existing" factory for the manufacture of gunpowder for the purposes of the Act.

Detailed description of injury caused by explosion.

The accident to which this Report relates occurred at 9.40 a.m. on the 21st February 1879, in the "glazing house" of the factory, numbered 58 on the plan attached to the aforesaid Continuing Certificate, and used, as its name implies, for the "glazing" of the gunpowder manufactured in the factory.

The effects of the explosion were of a terrific description. So far as the loss of life and personal injury were concerned, they were happily comparatively slight. It is one of the most remarkable circumstances connected with this serious explosion that only one man should have been killed thereby, and that of the eight persons injured only one should have sustained injuries of an important character.

The man who was killed (Thomas Jones) was undoubtedly in or at the glazing house at the moment of the explosion, and he was blown to atoms, small portions only of his body having been recovered, and these have been found scattered about the plantations up to 200 yards or so from the site of the glazing house and towards the S. The injured persons were as follows:—A man called Rose, who was in the corning house, distant 145 yards, and was slightly hurt in the back by a blow from a falling piece of woodwork of the house; a man called Tong who, running out of the mixing house (267 yards distant) when the explosion occurred was struck on the head by some of the débris and rather badly hurt; a man called Dane, who was struck by a nail on the face while working in the millwright's shop and store, distant about 190 yards; a lad who was injured by a portion of a lathe falling on him in the millwright's shop (190 yards); and the following persons, who were cut by pieces of broken glass: the millwright's wife, who was in a cottage in the factory distant 233 yards from the explosion; two women in the blasting-cartridge shop, distant 247 yards; and Mr. Winter, the incumbent of Oare, who was in his own parsonage outside the factory, and distant about 933 yards from the explosion. The personal injuries, except in the case of the man Tong and of Mr. Winter, were all of a very slight character.

The injury to property was unfortunately of a very much more extensive character, and will, I fear, entail a pecuniary loss upon the Firm of not less than about 10,000*l.* or 12,000*l.* Of the 64 buildings of all sorts which constitute the factory, and which are distributed as already described over an area of about 88 acres, I noted 50 which showed in some degree the effects of the explosion; while outside the factory effects (although not, so far as I could discover, of a structural character) have been produced.

As this explosion was of an exceptionally destructive character, I think it will be useful to place accurately on record the effects produced, working from the site of the explosion as a centre.

The accompanying plan of the portion of the factory mainly affected will assist in the study of the herein-after mentioned effects.

The glazing house, in which the explosion occurred, was a low, one-storied, wooden building about 61 feet long by 25 feet wide (exclusive of boat shed), standing on a brick foundation. It was provided with a double roof, the roof having originally consisted of a large tank to contain water, with a view to the extinction of any burning débris which might fall on to it from a neighbouring explosion. But a good deal of difficulty having been experienced from the leakage of the tank roof, it had ceased to be used in that capacity, and an outer slated roof had been constructed over it. This heavy construction of roof no doubt contributed largely to render the effects of the explosion so widely destructive. On the N.E. side of this building ran the water course, covered in front of the building by a boat shed, under which the powder for conveyance to and from the house was loaded and unloaded, a covered platform running along the side of the house inside the boat shed. Inside the house were placed 10 double glazing

* This is the distance of the church. The bulk of the village is about 500 yards off.

PLAN OF A PORTION OF MESSRS JOHN HALL & SONS' MA

...RSH GUNPOWDER FACTORY, FAVERSHAM. FEBRUARY. 1879.

..., ceilings, doors
...ass of damage extended to about 1000 yds.
...uctural damage to wood buildings
...of serious structural damage to brick buildings
59
63
PARISH OF PRESTON

N.B. *The areas assigned are not put forward as accurately defining the limits of particular classes of damage. In many instances injury was effected considerably beyond the assigned radius; in other instances such injury did not reach the limits. The areas are therefore approximate only; but they represent fairly the zones within which injury of the classes assigned was generally effected.*

DANGERFIELD. LITH. 22, BEDFORD ST. COVENT GARDEN.

...CALE
500 1000

tubs, the construction of which will hereafter be more particularly described. The main shafting and gearing for driving the glazing tubs were placed outside the house along the S.W. side, under a small zinc pent-roof; and the machinery could be stopped and started by a person outside the house. The power was derived from an engine situated in a large engine house 30 yards to the S.E. of the glazing house, and separated therefrom by an enormous traverse of earth, and a high substantial brick wall. The glazing house was not otherwise mounded or screened in any way, and the ground being, as stated, flat, there was no impediment other than the mound above named, and the thick surrounding plantation of small trees, to the free lateral distribution of the effects of the explosion. The building itself was completely destroyed by the explosion, portions of the timber, blackened, charred, and broken, being projected for several hundred yards, mainly towards the S. and S.W. (in which direction the wind was blowing), although towards the N.E. and N. (*i.e.*, against the wind), pieces had travelled to a distance of over 100 yards. The machinery was broken up into fragments, large wheels, pieces of metal, and the heavy wooden shafts of the glazers, broken in two, having been projected to extraordinary distances. I found one large portion of a glaze-tub shaft, not less than $\frac{3}{4}$ cwt. in weight, at a distance of 367 yards from the explosion, and a piece of metal weighing about 4 to 5 lbs. had been thrown with such violence against a brick building (No. 95) distant 467 yards, that it had deeply indented the brickwork, and bounded back many feet. The whole of the ground for a radius of rather over 100 yards towards the N. and N.E., and fully 300 yards, or even further, towards the S. and S.E. was thickly strewn with débris of all descriptions, some of which also had been caught in the trees and remained fastened there. On the site of the house itself there was a deep rectangular crater, into which the water had flowed from the canal, and much débris having fallen into it I was unable to estimate the depth. All around the side of the house were the broken trunks of the trees, many of which, especially those towards the N. and N.E., were blasted and blackened with the flash, and by the mud thrown up against them.

The wall which stood between the glazing house and the engine house appeared to have received a great part of the powder discharge on its N.E. corner, and to have been plastered with mud, being blackened at this part. The earth traverse appeared to be intact, but it also had a blackened appearance, and was covered with pieces of timber. The "range of flash" I estimated at about 40 yards, or 50 yards at the outside, towards the N.E.; it did not extend so far as any other direction.

(For view of site and surroundings see Photographs 1 and 2.)*

Proceeding to the N.W., the first buildings reached were the two stoves (Nos. 57 and 55), distant respectively 103 yards and 132 yards, and with an intervening boiler house (No. 56), distant 119 yards. Between the stoves and the glazing house, the only protection consisted of a plantation of small trees so closely planted that the buildings were not visible from one another. The stoves were of 9-inch brickwork, with slated roofs wood-lined throughout; the boiler house was also of brickwork and slated. The whole of this group of buildings had sustained serious structural injury. The S.E. end of the nearest stove (*i.e.*, the end towards the glazing house) had a complete breach of about 18 feet long and 4 feet deep, the whole of the brickwork of this part having fallen outwards, leaving only the wood lining standing; on the S. side there was a similar breach of about 9 feet long, and nearly the whole length of the wall had got a strong inclination outwards; the roof had fallen or been crushed inwards, some of the beams being broken. The wood lining had prevented any of the roof from falling through into the house. A few of the beams of the boat porch were broken, and nearly all the slates were stripped off. The building generally was in a very tottering condition, and will have to be almost entirely re-built. This stove contained 50 barrels of powder at the time of the explosion, and a man (Lewis) was in it at the time. The escape of the building from explosion was an extraordinary one (see Photograph No. 3.)

The same may be said with regard to the second stove (No. 55), distant 132 yards, which was "set," *i.e.*, contained 50 barrels of powder drying at the time, and which sustained injuries of almost exactly the same character and degree as the first stove.

The boiler house (No. 56) at 119 yards had its S. and S.E. walls considerably cracked and shaken outwards, a portion of the roof had fallen or was crushed in. The boiler appeared to be uninjured. (Photograph No. 4 shows the condition of the boiler and second stove.)

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* It has not been thought necessary to reproduce the photographs for the purposes of the printed Report.

About 100 yards to the W. and distant about 250 yards from the explosion, was the "dusting" house (No. 54), the plantation between being thick and continuous. This is a wooden building with a slated roof. It has sustained little injury beyond the breaking of the windows and the blowing in of some sashes on the side towards the explosion; a little of the woodwork on this side was broken. Some of the windows in the roof have been broken. Only one pane of glass had been broken in the window at the back of the house.

This is the furthest building in a W. direction which had sustained any marked injury, for the mixing and shifting house (No. 53), a wooden building, distant 367 yards, had only one or two slates disturbed, and beyond this no other buildings of the factory were injured at all. As we shall see, however, buildings in Oare village which *stood on higher ground* beyond the factory in this direction had sustained marked injury, although scarcely of a structural character.

Returning to the site of the explosion, and passing in a S.E. direction, we reach the brick-built engine house already mentioned, and the adjoining brick watch house (No. 60), distant 30 yards, and with an enormous traverse and wall between. These buildings are completely wrecked. The whole of the N.W. wall of the watch house (*i.e.*, the wall towards the explosion) was breached, and had fallen outwards; the slated roof was entirely off. The high roof of the engine house was completely stripped off, beams were broken, and the S.W. wall was badly cracked through. The boiler house was completely destroyed, the upper parts of the walls (14″ brick walls) being thrown down, the roof having fallen or been crushed in, and the lower parts of the walls being cracked through and bulged out. (Photographs Nos. 5 and 6 show how complete was the wreck of this building.)

The next house was the experiment house (No. 61), distant 67 yards, and situated in a deep pit formed by high mounds of earth, internally revetted with masonry, the entrance to this pit (except for the driving shaft from the engine house) being through a doorway in the S.E. side of the high traverse wall.* The building is of wood with a slated roof. It was not in use at the time. The whole of the side towards the explosion was destroyed, the boards having been torn outwards and lying on the opposite bank. The boat-porch was wrecked, and had fallen down. Some of the slates in the roof were disturbed. (Photograph No. 7 shows the injury sustained by this building.) The corning-house (No. 62), distant 145 yards, and situated in a deep pit, similar to that in which the last-named building was placed (and therefore protected altogether by four traverses of exceptional height and size), was a wooden building with a slated roof. The injury sustained was very similar to that recorded in the case of the experiment house, the side towards the explosion being completely ripped out, and the windows and roof being much damaged.

One curious effect was observable in a skylight window which, without having a pane of glass broken, was standing bolt upright in the roof. This boat-porch had the side towards the explosion torn out, and the porch seemed to have shifted bodily.

This house was at work at the time of the accident, and a man was just starting with a boatload of powder for the glazing house. Had the explosion been deferred for a few minutes all this powder would have been added to the exploded powder in the glazing house, no doubt greatly increasing the magnitude of the disaster and involving the boatman in the destruction. Happily this house escaped, though one man (Rose), who was close to the wall of the house towards the explosion, sustained slight injury from a blow in the back from a piece of timber.† (See Photograph No. 8 for injury to this house.) Among the débris which had been projected to and towards this building was a portion of the head of a brush, from the glazing house, the bristles of which were shrivelled with fire and were probably alight when it fell. This brush descended a few yards from the house. A few yards short of the house (117 yards from the explosion) was a heavy half glaze-tub shaft, weighing with its metal end about $\frac{3}{4}$ cwt.

Almost due S. of the explosion, at a distance of 233 yards, stood the (wooden) press-house (No. 64) in a deep pit, surrounded by mounds similar to the pits employed for the protection of the experiment and corning houses. This house had sustained structural injury. The N.E. side had been partly torn outwards, and the windows on

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* This building stood on the site of the corning house which was destroyed in the great explosion of the 28th December 1867, when a double press house and expense magazine were also exploded, and 11 lives were lost.

† The group of buildings consisting of the glazing house, engine house, experiment house, and corning house, occupy the sites of the buildings which were destroyed in the great explosion of gun-cotton, which occurred in these works in 1849, when a considerable number of lives were lost.

this side had, some of them, been sucked out with such force that the shattered glass had been thrown violently against the brick wall of the pit side, distant 12 feet, and some pieces of the glass were actually sticking into the bricks. Some of the lead on the roof was ripped and distorted, the skylights were broken, and one of them had been drawn open. This house was at work at the time, a press being in operation; fortunately it was not exploded.

The brick engine house (No. 63), situated to the S.E. of this house, just outside the pit, and under the shelter of the mounds, escaped injury. Even the windows were not broken.

There is a little dilapidated wooden shed (No. 107), distant 317 yards from the explosion, and almost due S., which had been rendered somewhat more dilapidated by the explosion, some of the roof joints having been broken, and the boards in the sides stripped off.

There was no further structural injury in a S. direction, the next buildings in this direction being the stables (No. 105) at 467 yards in which only a few panes of glass were broken; the waggon shed (No. 106) at the same distance was uninjured, and the foreman's cottage (No. 104), distant 500 yards, in which some glass and a portion of a window frame towards the explosion were broken. The watch house (103), distant 533 yards, and the shed (102a) close to the watch house were uninjured.

To the S.S.E. of the explosion, and distant 163 yards therefrom, was the expense magazine (65), a wooden building in a deep pit, similar to the pits already described (but closer to the walls of the house). The side of this building towards the explosion had been wrenched outwards about a foot or more from the brick foundation, and the pit itself contained a large quantity of the projected and blackened débris. Messrs. Hall were about to place a roof over this building on to the sides of the pit, to convert it into what would be in fact a brick building, and so comply with the provisions of the Act* in regard to expense magazines, to which it had been my duty to direct their attention at my inspection of these works on the 31st December last. The presence of the charred débris inside the narrow pit within which the house stands, and almost in contact with the wooden walls, coupled with the fact that, owing to the wrenching out of the side, the powder in this building was all exposed, is an illustration of the sort of danger which the wise statutory provision which requires expense magazines to be "well and substantially built of brick or stone" is designed to afford.

To the S.W. of the explosion, at distances of from about 167 to 317 yards, lay a considerable number of buildings with almost continuous plantations of young trees between them and the explosion.

The first of these which calls for notice is the hand-mixing house (66), distant about 170 yards, a low brick building wood lined with intervening plantations between it and the explosion. This building had the whole of the sashes and glass on the side towards the explosion blown violently in, pieces of the glass sticking in the woodwork on the opposite side. A portion of the wooden porch (at N.W. end) was broken, and many tiles on the roof were broken.

A disused wooden charge house for cartridges (67), distant 167 yards, had the locked door torn open, and one half of the door ripped off; a large portion of the woodwork of the building was broken.

An old brick watch house (72), distant 193 yards, had a good deal of the roof off, and portions of the ceiling down.

A disused cartridge factory room (71), distant 206 yards, had the roof considerably damaged, a very large proportion of the slates being off, and nearly all the window glass on the S.E. side, and some of the (iron) window frames were broken.

The bulleting and crimping shed (70), distant 200 yards, had two of the iron window frames towards the explosion blown in, and one frame on the opposite side fractured. Nearly all the window glass was broken, and the roof was almost completely stripped, hardly a tile being left on the N. side. The greater part of the plaster in the interior had fallen, and a door at the side had been blown in. Close to this house I found one of the "gudgeons" of a glaze-tub shaft, weighing about 30 lbs.

The millwright's shop and store (68), distant about 190 yards, had the window frames on the side towards the explosion blown in, the frames on the opposite side were broken and had fallen inside the house. The roof of this building, which was exposed to the full effect of the blast, being higher than the intervening trees, was completely wrecked along its whole length, and a large portion of it had fallen through on to the wooden ceiling, which it had also broken. A man in this building had sustained slight injury

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* Explosives Act, 1875, schedule I., Part I., sub-section (5).

through being struck by a nail on the face. He had also been thrown down by the shock. The store (69), distant about 217 yards, is a low wooden building running parallel to the millwright's shop, and sheltered behind it. The whole of the lower (or protected) part had been drawn out bodily from the foundations, in some places to the extent of a foot, and the whole of this side of the building was more or less bent and distorted. Some of the timbers of the roof were broken, and in one place, a large mass had fallen through; the doors were broken. Large pieces of charred timber lay on the top of this house.

The carpenter's shop (73), distant 233 yards, had two window frames smashed, the door broken in, and the roof a good deal damaged.

A brick store (74), distant about 233 yards and fairly screened by the buildings 68, 69, and 70, had sustained considerable structural injury, the E. corner having been, so to speak, wrenched asunder, and the brickwork of a part of the end and sides having been thrown down and the weather-boarding ripped open. The lead on the ridge of the roof was stripped off and some slates were off.

This was the furthest point, so far as I could discover, of material structural injury to a brick building.

The millwright's cottage (75), at 233 yards, and screened by 68 and 69, had all the glass and some sashes on the side towards the explosion broken, and most of the ceilings on the N.E. side of the house, considerably damaged. On the opposite side of the house the damage was confined to the breaking of window glass. The roof was a good deal knocked about. The millwright's wife was in this house at the time and was cut by some of the broken glass. The office (No. 77) and adjoining store (No. 76) were in the same block of buildings as the millwright's house, and had sustained injury to the windows and roofs.

The blasting-cartridge house (No. 78), distant 247 yards, had nearly the whole of the window frames towards the explosion blown in, and every pane of glass on this side of the house broken. The broken glass was blown with violence across the building, in which a number of women were at work, fortunately only slightly injuring two of them.

The windows on the side from the explosion were mostly broken and one or two of the sashes.

The roof of the building had a large number of tiles broken and stripped off. (Photograph No. 9 shows the condition of this building, and includes a portion of the mixing house.)

The mixing house (83), distant about 267 yards, and to a great extent screened by intervening buildings and the plantations, had the wooden pent house in front considerably broken and drawn out, the glass in the skylights and windows generally broken, as well as a number of the slates in the roof. (A portion of this building is included in Photograph No. 9.)

The extracting house (80), distant 267 yards, and *half* protected by the cartridge shed and smithy, had the protected half of the roof hardly injured, while the unprotected half was almost completely stripped. The value of protection here was very signally illustrated. One window frame (protected) had been drawn out, one (unprotected) frame had been blown in.

The saltpetre refinery (81), distant 283 yards and sheltered by other houses, had the slate roof a good deal damaged, and some of the lower parts of the wooden sides sucked out.

The weigh house (84), a brick building at about 280 yards, had the windows broken, but had sustained no other damage.

A brick charge house (No. 85), distant 307 yards, had the wooden door (towards the explosion) cracked through. There were no windows in this building.

About W.S.W. of the explosion, and distant therefrom 367 yards, was the factory magazine (87), a brick building with tiled roof. The building had sustained no structural injury, but most of the window glass was broken, as well as two of the frames in angles on the side away from the explosion. The door (towards the explosion) had been slightly wrenched, but was not broken. Some pieces of débris, including pieces of lead, had been projected up to this building, and I found charred pieces of wood beyond it.

In the S.W. corner of the factory stand the incorporating mills, charge houses, and one or two other small buildings, none of which (except the mills) had sustained any very marked injury. The wooden mills, made purposely light to yield readily to explosion from within, and situated at distances of from 520 to 573 yards, had some portions of the wood panelling on the sides towards the explosion drawn out; but

sustained no other injury. The shock of the discharge was sufficiently violent to cause the drenching apparatus to act in all the mills.

A few of the slates on the roof of the engine and boiler houses were broken and one window.

The brick charge houses (94 and 102), distant 493 and 510 yards respectively, had sustained no injury. These buildings have no windows.

A brick store (95) at 467 yards, was also uninjured, except from the impact of a piece of metal weighing about 5 lbs. which had been projected violently against it, deeply marking the brickwork.

A straw store (88), distant about 500 yards, had some window glass broken on the side away from the explosion. There were no windows towards the explosion.

Such are the more noticeable of the injuries sustained by buildings within the factory.

Outside the factory, I have been unable to discover that any marked structural injury was produced. The village of Oare being situated on high ground, about 917 yards from the site of the explosion, showed the most marked effects; but even here I was unable to discover anything more serious that the fracture of a few window frames and sashes, and of a considerable amount of glass, including some of the church windows. The lead lights of several windows were bent and twisted. In one or two instances, I am informed, ceilings have been damaged.

The newspaper accounts of the damage in Faversham (the outskirts of which are distant from 1,100 to 1,300 yards from the site of the explosion and the town hall about 1,560 yards) appear to have been exaggerated, the effects, so far as I have been able to ascertain, having been limited to the breaking of glass, in some cases of large plate glass windows. A brick chimney in "Waller's Row" was slightly injured, but I believe that neither in Faversham or at Oare, or anywhere outside the factory, have any buildings been unroofed, or any structural damage produced.

The amount of gunpowder by which the foregoing effects were produced was almost exactly 7,000 lbs., or according to a gunpowder maker's measurement $3\frac{1}{2}$ "tons" (so-called) of 2,000 lbs. each. The powder was not of the strongest quality, being only blasting powder.

A careful examination of the effects above recorded appears to establish that the areas affected in this instance by the explosion of 7,000 lbs. of blasting powder were approximately as follows:—

Summary of observations as to effects.

	Yards.	More broadly the figures may be taken as,—
Radius of scorching effects, or "range of flash" -	40	50 yards.
Serious structural damage, brick buildings - -	132*	200 „
„ „ wood „ - -	283†	300 „
Broken window frames, sashes, ceilings, doors:		
On the flat - - - - -	367‡	400 „
On higher ground (outside the factory) - -	900	1,000 „
Dangerous projection of débris - - -	467	500 „
Broken glass § - - - - -	about 1 mile.	

It would, of course, be unsafe to assert that in no case could the explosion of 7,000 lbs. of gunpowder produce effects beyond the radii above assigned; on the contrary, it may be assumed that without the protection of the intervening plantations

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* The stove, No. 55, distant 132 yards, was the furthest brick building which had sustained serious structural damage, except the carpenter's shop, No. 73, distant 233 yards. But the damage to this latter building must be regarded as exceptional, because other brick buildings considerably within this distance and unprotected except by trees (*e.g.*, the hand-mixing house, No. 66, distant 170 yards, and the old watch house, No. 72, distant 190 yards,) sustained no structural injury. It is probable that the injury to the carpenter's shop, No. 73, was due (1st) to the light construction of the building, (2nd) to some special local wave action, resulting from the deflection of the air current among the surrounding buildings. An allowance of 200 yards as the extreme radius of general serious structural damage in the case of brick buildings seems therefore ample.

† The saltpetre refinery, No. 81, distant 283 yards, was the furthest wooden building which appeared to me to have sustained what may fairly be called structural damage, except the incorporating mills at from 520 to 573, but these buildings are of a special light construction to yield readily in the case of an explosion, and the effects produced on them must be regarded as exceptional.

‡ The factory magazine, No. 87, at 367 yards had some of the woodwork of the windows broken and the door wrenched, and was the furthest instance which I remarked of injury to the woodwork of windows, &c. within the factory, except the cottage (No. 104) at 500 yards, which had a small piece of a window frame broken.

§ Fifty panes of glass were broken at Sindal, distant about one mile.

which existed in this instance, the effects would have been even somewhat more extended. Also, the powder which exploded was not of the strongest quality.

On the other hand, it should be observed that owing to the building being provided with the heavy tank roof, and with another roof over that, the conditions were peculiarly favourable to the production of large lateral effects; and the circumstances that the powder was itself under some measure of confinement in the stout glazing tubs, and had been somewhat warmed by the three hours' friction in the process of glazing which it had undergone,* would also be favourable to the development of force. Altogether, therefore, these effects may not unfairly be taken as average effects for an explosion of this character, and, regarded in this light, it is interesting to compare the distances above quoted with those which in conjunction with Major Ford, and relying upon the experience of other explosions, I have laid down as the distances proper to be imposed in licenses for the storage of 7,000 lbs. of gunpowder. The licensed distances are not assigned with reference to the prevention of the breakage of windows or to offering complete security from injury from débris, for to attempt to impose distances of this character would be to impose what in a large number of cases would prove impossible conditions upon the trade, and would go far towards preventing the use of explosives altogether. But we felt that the public have a right not to have their houses blown about their ears, or even their window sashes destroyed, ceilings shaken down, or doors forced open by explosions in their vicinity. And the results of the present explosion on the whole afford satisfactory evidence that the distances we have fixed as those which should be imposed in licenses for this amount of powder are approximately correct, that is to say, that they would give such reasonable security to the public against structural or other serious injury, as is consistent with a due regard for the interests of the trade in explosives, and of the trades, such as mining, whose existence more or less depends upon their use. Before quitting the subject of the effects produced, it may be useful to offer one or two observations in regard to these effects.

Value of mounds and traverses.

In the first place, this explosion affords, in my judgment, an excellent example of the value of protecting mounds or traverses. I am disposed to believe that had the corning house (No. 62), the press house (No. 64), and the expense magazine (No. 65), been out in the open, exposed to the full effects of the explosion, it would hardly have been possible for them to have escaped communicated explosion.

As it was, although these buildings sustained serious injury, the presence of the traverses converted what might have been *blowing-in* effects into *sucking-out* effects. Thus the whole of these buildings, being protected from the direct impingement of the blast, were injured mainly by the partial vacuum momentarily created outside them by the rush of air into the vacancy created partly by the intense atmospheric disturbance which is the first effect of a powerful explosion, and secondarily by the rapid contraction or disappearance of the large mass of enormously heated gases, and non-permanent gaseous products which the explosion had liberated.† The partial vacuum which thus becomes established external to the building produces a sufficient disturbance in the balance between the internal and external atmospheric pressure upon the walls or parts of the building to subject the same to what practically amounts to a violent sudden internal pressure or blow. These vacuum effects, if so they may be described, were very remarkably illustrated in this instance. A reference to the record which I have given of the effects will show that in numerous instances the walls were sucked out, boards ripped off, doors wrenched open, window frames opened, and glass thrown violently outwards, even to the extent in one instance of sticking into brickwork at 12 feet distant. These effects, though disastrous enough, are not those which tend immediately to cause the explosion of a powder building in which they may occur, nor to injure the people within.

Circular pit traverses calculated rather to increase secondary effects.

In the second place, it is worthy of notice that the circular pit traverses in which some of the houses stood, being unfavourable to the rapid inflow of air to supply the place of the air which had escaped, had probably served to intensify the vacuum effects above referred to.

Protection afforded by trees.

Thirdly, the protection afforded by trees has once again proved highly valuable. I doubt if the stoves (57 and 55) could possibly have escaped had there not intervened a thick plantation; and even the escape of the dusting house (54) has, no doubt, been greatly favoured by the presence of the trees. It is noticeable also that even the trees

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* The powder had been placed in the glaze tubs between 6 and 6.40 a.m. that morning, and the machinery was set in motion about the time last-named.

† Professor Abel and Captain Andrew Noble in their valuable researches on fired gunpowder, estimate the non-permanent products of explosion, *i.e.*, the products which ultimately assume the form of solid matter, at about 57 per cent. by weight, the remaining 43 per cent. consisting of permanent gases.

have so far played the part of a traverse as to have converted the effects into the sort of sucking-out effects which were so observable in the case of traversed buildings; thus, the walls of the stoves and boiler house fell outwards; so did the walls of the watch house and engine house. I have little doubt that this action was assisted by the strong thrust of the roofs, which were themselves forced downwards by the air pressure which passed over the tops of the trees.

Secondary or vacuum effects.

Fourthly, the sucking-out or vacuum effect is almost uniformly traceable wherever a building, or part of a building, has received protection from some other building. One of the best examples of this is furnished by the stores (69) and by the window frames in the extracting house (80); in each case the part of the building which was protected has come outwards, while the unprotected parts have gone inwards.

Desirability of providing large powder-houses with traverses and adopting light construction.

Lastly, I conceive that the effects of this accident point to the desirability, amounting almost to a necessity, of providing all working powder buildings in which considerable quantities of powder are liable to be present, with substantial mounds, arranged with reference to the limitation of the lateral effects in dangerous directions, and also to the importance of making the buildings themselves of light structure, especially as regards the roofs, and of avoiding so far as may be practicable large sections of timber in their construction.

General system of glazing gunpowder.

The operation of glazing gunpowder may be generally described as follows:

A quantity of gunpowder is placed after dusting and before drying into a large barrel, or "glaze tub," which is made to revolve on an axial shaft at a comparatively low speed. By this means sufficient friction is established among the grains to impart to them, according to the character of the powder and the duration of the operation, a considerable degree of polish, which in some cases is increased by the addition of a small quantity of black lead.

The details of the process of glazing differ in different factories, and according to the description of powders which are being operated upon. The size of the tubs, the constructive details of the machinery, the rate of speed, and the duration of the process vary considerably, and in the case of some powders a second "glazing" is applied after the powder is withdrawn from the stove. Substantially, however, the process is, as above described, a process of glazing by attrition. It is obvious that with suitable machinery the operation is not one which entails a high degree of risk. The powder is not subjected to the crushing and grinding which it receives in the incorporating mills and in the "breaking down" and "corning" machines or to the intense pressure which is applied in the press. Being inside the "glaze tubs," the powder is not in contact, as in other operations, with the external machinery, and although the friction established among the grains is sufficient to raise the temperature of the powder considerably, the temperature so attained falls far short of the igniting point of gunpowder, while the intense local elevation of temperature which in a corning machine may arise from the presence of a hard foreign body can with difficulty become established in the glazing tubs; consequently, what may be designated the special risks* attending the glazing of gunpowder in suitably constructed glazers, are few and small, and in some respects are still further reduced by the fact that the glazers once started can be left to themselves, the men only entering the house occasionally to oil the machinery and to remove and replace the glazed powder.

Accidents in glazing houses.

A glazing house is consequently regarded by gunpowder manufacturers as one of the safest houses in the factory, a view which finds confirmation in the fact that, so far as I have been able to discover, before the present case there has only been one instance recorded in this country of an explosion having originated in a glazing house.† This case occurred at Lowood in February 1863, when a man was engaged in cleaning and preparing for work a glazing house which was supposed to be empty, but in which there appears to have been sufficient powder to kill the man (who was scarcely disfigured), and to throw some ignited woodwork on to a corning house, which was separated only by a water wheel, and which in its turn fired and exploded a press house. This can hardly be regarded as the explosion of a glazing house proper, the accident having evidently been unconnected with the operation of glazing, and the house not having been at work at the time; it was probably caused by some incautious act of the man in cleaning the machinery.

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* By "special risks," I mean risks independent of and distinct from those which more or less beset the manufacture of all gunpowder; risks, that is to say, specially connected with and incidental to this particular operation.

† The Quarterly Review, July 1868, Vol. 125, p. 119. Handbook of the Manufacture and Proof of Gunpowder, p. 73. In these publications two cases of explosions originating in glazing houses are recorded, but I have ascertained by inquiry that one of these, viz., the explosion at Ballincollig in 1859, really originated in a dusting house and not in a glazing house.

Large quantities usually present in glazing houses.

The quantity of gunpowder which may be present in a glazing house is not, as in the case of incorporating mills, press houses, and corning houses, limited by statute; indeed, it does not appear that even the indefinite limitation "what is necessary for the immediate supply and work," which applies in the case of stoves and dusting houses, applies to glazing houses, although under section 10, § (12) of the Explosives Act, 1875, all powder which has been glazed must be removed from the building "with all due diligence" after the completion of the operation. This absence of any express statutory limitation (which may perhaps be traced to the comparative immunity from formidable special risks which glazing houses enjoy), leads in many instances to the accumulation of very large quantities of gunpowder in glazing houses; thus, at my inspection on the 31st December last, of the glazing house which has now exploded, I found present there in no less than about 13,000 lbs. (or $6\frac{1}{2}$ tons) of gunpowder; on another occasion, in the glazing house at Messrs. Hall's Oare Works (an exactly corresponding building) as much as 17,000 lbs. (or $8\frac{1}{2}$ tons) of gunpowder. Fortunately, on the present occasion the amount of powder in the house at the moment of the accident was much less (only 7,000 lbs.), but had the accident happened 10 minutes earlier (before the last boat-load of glazed powder had been removed from the house), or 10 minutes later (after the boat-load which was just starting from the press house had arrived), the quantity would have been considerably greater.

System of glazing adopted at the Marsh Works.

The glazing house in which this accident happened appears to have been erected, and the machinery for the same supplied, in 1856. The glazing machinery consisted of 10 double "glaze tubs," *i.e.*, 10 pairs of "glaze tubs," each pair revolving on an octagonal wooden shaft of $8\frac{1}{2}$ inches across the flats. The glaze tubs were each 5 feet $2\frac{1}{2}$ inches long, and 2 feet 2 inches in diameter at the bilge, and were copper hooped. Some of the tubs were of yellow deal and had a thickness of 2 inches in the centre to $1\frac{1}{2}$ inches at the ends. Others were of oak and had a thickness of $1\frac{1}{4}$ inches in the centre, and 1 inch at the ends. The tubs were set 12 inches apart, and the total length of the wooden shaft which supported each pair was 12 feet 11 inches. The tub shafts were of best memel fir (yellow deal), and of a total weight of about 187 lbs. To each end of the shaft was fixed a cast iron, winged "gudgeon," having a cylindrical neck of 3 inches diameter, which neck rested upon 15-inch brass anti-friction wheels, working through an oil bath. The driving motion was all outside the house, at the back, under a zinc pent-house, and, by means of an arrangement of clutches, operating upon the gudgeons, any one pair of tubs could be set in motion or stopped at will, or all the tubs could be driven at once. Each pair of tubs would take the contents of eight "kits" of about 90 lbs. each=720 lbs., giving a total glazing power for the house of 7,200 lbs. The tubs were generally driven at a speed of about 28 revolutions a minute, two pairs admitting of a somewhat higher speed. The whole of the machinery, except the tubs, had been supplied by Messrs. J. & E. Hall, engineers, of Dartford; the tubs had been made at Messrs. Hall's Oare Works. Except in one important particular, as to which I shall have to remark hereafter, the arrangement appears to have had nothing very special or exceptional about it; and was substantially the same as that which is adopted in most factories.

Amount present in house at time of accident.

On the day of the accident, William Rose, the leading hand of the corning house, accompanied by seven other men, unloaded the glaze tubs (which had been running throughout the night), at about 6 a.m., and removed therefrom the contents of 80 "kits," of about 90 lbs. each. They then re-loaded eight pairs of the glazers, placing the contents of eight "kits" of 90 lbs.* of common blasting powder in each of the seven most westerly glazers, and six "kits" of 90 lbs. each in the next pair. The two most easterly glazers, constituting what was known as the "small set," were not charged. The quantity of powder in the glazers was thus 62 kits of 90 lbs. each=5,580 lbs. The operation was completed about 6.40 a.m., and Edmund Willis told Thomas Jones (the engine-man, deceased) at about 10 minutes to 7 that he might start the tubs. In addition to the powder in the glaze tubs, there were in the house, partly inside and partly on the platform, 16 kits of 90 lbs. of the same powder awaiting glazing=1,440 lbs. The total quantity in the house, in the glaze tubs and awaiting glazing was thus 7,020 lbs. The whole of the powder which had been removed that morning from the glaze tubs had been taken away from the house by a boatman called Mannock, the last load (of 40 kits) having been removed by him only about five minutes before the explosion, and

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* The estimate of 90 lbs. per kit is based partly upon the experience of the men, and partly upon an experiment made by Mr. Whiting, the manager, at my request, since the explosion. Mr. Whiting took at random six kits of unglazed and six kits of glazed powder, of the same quality as that which was in the house when it exploded; he found that the six unglazed gave an average of $89\frac{3}{4}$ lbs., and the six glazed (among which were two exceptionally light) 88 lbs.

his boat having just reached the stove when the explosion occurred. A boat (in charge of H. Stevens) was in the act of setting forth from the corning house to the glazing house when the explosion occurred. Thus, as already stated, the explosion happened at a most fortunate moment, between the departure of one boat-load and the arrival of another; and thus the quantity of powder in the house fortunately did not exceed the amount above stated, viz., 7,020 lbs.

The explosion occurred, as has been already stated, at about 9.40 a.m., five minutes after Mannock had left the house with his boat load, and when no person except Thomas Jones (the deceased), was in the immediate vicinity of the house. Mannock states that Jones was certainly not in the house when he was there loading his boat, and he did not see him outside the house, as he states he would have done through the windows at the back had Mannock been there for the purpose of oiling the machinery. If this be correct, it follows that Jones must have come to or into the house during the five minutes which elapsed after Mannock left, for the fact of his body having been blown to atoms testifies unmistakably to the fact that he was on the spot when the explosion occurred.

Examination into cause of accident.

I propose in proceeding to endeavour to ascertain the cause of the explosion, to follow the course which in similar inquiries I have found it useful to adopt, viz., to set out *all possible* causes which may exist in cases of this sort, and then dismiss those which in the particular case under consideration could not have existed, or the probability of the existence of which appears to be particularly remote. Thus, by getting rid of all those causes which could hardly have existed, we are left with a few to which a higher degree of probability attaches, and it may, perhaps, be possible to select from these the one cause to which the accident may be most reasonably attributed.

The following summary, I believe, includes all possible causes whence accidents in gunpowder factories may proceed :—

A.—Causes immediately connected with Tools or Machinery.

1. Inherent defect in construction of machinery or implements.
2. Defective working of machine or tools, due to—
   - (1.) Fracture or distortion by wear or otherwise;
   - (2.) Clogging;
   - (3.) Other disturbance;
   - (4.) Improper application.
3. Fall of tool or portion of machinery.
4. Heated bearing.
5. Ignition caused in repairing or cleaning machinery.

B.—Causes independent of Tools and Machinery.

(*a.*) *Accidental Causes.*

6. Lightning.
7. Fire from external source.
   - (1.) Adjacent chimney;
   - (2.) Passing engine;
   - (3.) Other source, *e.g.*,
     - (*a.*) Men taking fire from watch house or engine room (on their clothes, on cooking utensil, or otherwise); or
     - (*b.*) Fire from glue pot; or
     - (*c.*) Concentration of sun's rays.
8. Sparks from—
   - (1.) Article of iron;
   - (2.) Articles of glazed earthenware.
9. Spontaneous ignition of cotton waste, &c.
10. Smoking:
    - (1.) In or near building;
    - (2.) Unextinguished pipe in workman's pocket.
11. Lucifer match:
    - (1.) From workman's pocket;
    - (2.) Left lying about.
12. Foreign substances, such as small stones, gritty particles, articles of metal, nuts, bolts, nails, &c. introduced,
    - (1.) On shoes or clothes;
    - (2.) On tools, machines, or cotton waste;

(3.) On barrels or barrows;
(4.) By being blown in;
(5.) In the ingredients:
(*a.*) If imperfectly sifted;
(*b.*) Contracted from walls and roofs of the buildings after sifting;
(*c.*) Derived from a machine or tool;
(*d.*) Contracted during conveyance.

(*b.*) *Wilful Acts.*

12. Matches, &c. wilfully introduced during the absence of workpeople.
13. Wilful ignition of powder dust outside.
14. Wilful introduction into ingredients of foreign substance before the same were brought into the building.
15. Wilful act of workman—
(1.) While in state of insanity;
(2.) While in state of intoxication;
(3.) With object of committing suicide.

Examination of possible causes.

Defective construction of machinery or tools.

1. *Inherent defect in construction of machinery or implements.*—As already stated, the machinery and glazing tubs seemed well calculated *so long as they remained in good working order*, to perform the work for which they were designed. The construction generally is a well known and well tried one. Messrs. Hall have had satisfactory experience of it in this house since 1856, and for about the same time in their Oare Works. There was no iron in the interior of the tubs, nor any special source of friction. The foreman of millwrights (James Davidson) who has had these machines under his personal observation for several years, expresses himself satisfied with them. The only tools allowed in the house, were a wood mallet and setter for tightening the hoops of the tubs, and no suspicion can attach to these. I am of opinion that it cannot be reasonably suggested that the accident was due to any defect inherent in the machinery or tools.

Defective working of the machinery or tools.

2. *Defective working of machinery* (*or tools*).—It appears that there did exist in connexion with the machinery in this house, a certain possible risk of fracture in an important part, viz., the tub-shaft. These shafts, as stated, were made of wood and were about 13 feet long. They were of an octagonal section, $8\frac{1}{2}$ inches across the flats. They were made of best memel timber. I have no doubt that shafts of this construction are normally well up to the weight which they are called upon to bear. These weights would be approximately as follows.

Weight of shaft - - -	187 lbs.
„ 2 glazing tubs (at 224 lbs.) -	448 „
„ powder - - - -	720 „
	1,345 lbs.,

or not much more than half a ton distributed along the shaft. Mr. Burke, of the firm of Messrs. J. & E. Hall of Dartford, has kindly furnished me with the following estimate of the strength of a shaft of this description. The breaking weight of such a shaft, supported at each end, and with the load in the centre would, he calculated, be 30 tons, and a safe load six tons; with the load distributed (as was the case here) the breaking weight would be 60 tons, and the safe load 12 tons. Obviously, therefore, the margin of safety here was enormous. The neck of the gudgeon being of three-inch cast iron, is of the dimensions employed to carry even heavier glazers than these, and may be regarded as affording an ample margin of strength. But notwithstanding these facts, it transpired in the course of my inquiry that there have twice occurred fractures of these tub-shafts in Messrs. Hall's factories. The last case occurred early in October of last year, in the building which has now exploded. The shaft broke without any warning a few minutes after a boatman named Charles Wood had just left the house on his way to the stove. He heard a fall and went back, and found that the wooden shaft of the third pair from the east had broken completely off outside the tub, at the shoulder (just beyond the gudgeon) at the driving end, and the tub had fallen on to the floor, the driving shaft and gudgeon were continuing to work, but fortunately were working clear. The man instantly stopped the machinery, and the foreman of millwrights was called. It appears that this accident excited some dismay at the time, for Thomas Jones afterwards observed to his son, "Tom, we have had a very narrow escape, one of our shafts has broken."

Instances of fractures of glaze tubs shafts.

The foreman millwright, whose duty it is to examine all the machinery weekly, and to furnish a written report of its condition, informs me that he failed to observe any premonitory symptoms of fracture in the shaft. His written reports, which I have looked through, confirm this. He had examined the shafts as usual a day or two before the occurrence, and had noticed no appearance of weakness. The failure was quite sudden.* The millwright considers it was probably due to the wood having become affected by a leak in the tank roof immediately above that part of the shaft.

The other case of the fracture of a glaze-tub shaft occurred in Messrs. Hall's Oare glazing house about four or five years ago. The shaft was of the same construction as the shafts at the Marsh Works. It went equally without warning; but in this instance the foreman millwright tells me that there were no grounds for suspecting that the wood had been affected by damp. The fracture occurred in the interior of the tub,† and there can be no doubt that an explosion was most narrowly escaped on this occasion, for the falling of the tub broke the gudgeon, the driving part of which continued to revolve, while the fractured end remained nearly in contact with the revolving portion; it was found in this position by the engine-man, Akers, who, realising the magnitude of the risk, was greatly excited thereby. It is therefore undeniable that these shafts, notwithstanding their large margin of strength, may break, and when they do break they may go without warning, and their fracture may obviously constitute a risk of the first order. The system of weekly overhauling of the machinery which Messrs. Hall have very properly adopted,‡ does not therefore, it is obvious, afford a complete safeguard against this risk, and I am of opinion that Messrs. Hall would do much towards removing this source of danger if they were to substitute for these wooden shafts, shafts of iron or steel cased in wood, such as are employed in the majority of factories, and either provide a separate shaft for each tub, or at any rate support the shaft by means of a central bearing. The absence of a central bearing in a shaft 13 feet long must tend, I am informed by competent mechanical authority, to produce "sagging" or yielding in the shaft, which even if it does not ultimately eventuate in a fracture, may readily throw the arrangement out of truth, and by producing an eccentric movement tend to expose parts of the machinery to dangerous friction and to subject the whole to abnormal or destructive influences.

Fall of tool or portion of machinery.

3. *Fall of tool or portion of machinery.*—If an iron tool or any portion of the machinery be allowed to fall in a powder house, it is possible that an explosion might be occasioned therein. One striking instance of this is afforded by the serious accident which occurred in Messrs. Bickford, Smith & Co.'s "safety fuze" factory at Tuckingmill, in March 1872, and which was occasioned by a steel bar falling on to the steel standard or portion of a machine, and igniting some powder in the joints of the floor, which communicated with some fuze, and caused the deaths of eight girls. But in the present case not only were no iron tools used or required in the house, but short of the actual fracture of the machinery (which is discussed under another head) it is difficult to see how anything could have fallen whereby an accident would be likely to have arisen. I think, therefore, that this cause may be dismissed.

Heated bearing.

4. *Heated bearing.*—The tub-shafts at this factory revolved on 15-inch anti-friction brass wheels working through an oil bath, and although it is admitted that in very cold weather owing to the thickening of the oil the wheels sometimes worked dry, even this condition of things would scarcely be likely to create any dangerous amount of friction, for the anti-friction wheel would still revolve, and the temperature at or about the time of this accident was not such as to thicken the oil, a circumstance which is sufficiently attested by the fact that the same description of wheels and the same oil were working quite satisfactorily on that occasion in the Oare glazing house.

The only other bearings where heating might arise were outside the house, and these I am informed were oiled regularly twice a day. Moreover, being outside a house which cannot be regarded as a very dusty one, the liability to dry powder dust escaping so as to get into contact with them, and to be capable of being ignited by the heating of the bearing, is very remote indeed.

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* It is also worthy of being recorded that within the last two years the whole of the machinery in this house was overhauled, taken out, and reset (the floor of the house being relaid and releathered at the same time). There was therefore within some 18 months before this fracture a very special opportunity of observing the condition of the shafts, and no appearance of weakness or premonitory symptons of giving way was then noticed.

† The wearing away of these shafts in the centre is surprising. I found on examining some of the pieces recovered after the explosion that the girth of the shafts had in some instances worn down from 30 inches to 24 inches.

‡ In addition to a daily overhauling by the leading hand of each house.

In my examination of the Oare glazing house I found hardly any powder dust outside the house, and none of it dry. The probability of the accident having occurred through the heating of a bearing need not therefore in my judgment be seriously entertained.

Ignition caused in repairing or cleaning machinery.

5. *Ignition caused in repairing or cleaning machinery.*—Even if we assume that the man Thomas Jones was prepared to disregard the very distinct regulations which forbid the carrying out of any repairs in a danger house while powder is therein (sec. 10. § 5), as well as those which Messrs. Hall have laid down in their special rules prohibiting the carrying out of any repairs except on the written authority of the manager or of some member of the firm, and then only under the personal supervision of the departmental foreman,* I say, even assuming that Jones was prepared to disobey these instructions, two further assumptions will be necessary in order to connect the accident with such act of disobedience, viz., first, that the machinery was likely to have required repairs; second, that the repairs so required were of a character which would have been likely to entail accident. I am given to understand by the foreman millwright and others who worked in this house, that so far as could be seen the machinery was in thoroughly good order, and it is not considered probable that it could have called for any repairs. Moreover, it is difficult to see what repairs could have been required, that Jones unaided would have been able to effect. Eight out of the ten pairs of tubs were running, and with these (unless he stopped them) he *could* not have carried out any repairs. And as regards the two idle pairs, these are stated to have been in thoroughly good order. They had been worked up to the morning of the explosion (about 6 a.m.), and would have been in work again that afternoon. Moreover, repairs to glazing machinery are not generally of a character which admits of being carried out *in* the building, or by a person unprovided with suitable implements. The tightening of the hoops, if that is to be regarded as a sort of repair, is readily effected with a wood mallet and setter, and would hardly constitute an appreciable danger.

As regards cleaning, we have the case of the Lowood Explosion of 1863 to show that a careless workman, while cleaning, may produce an accident, and no doubt if Jones had attempted to remove any powder encrustation with a metal tool from the interior of the glazing tubs, he would have been incurring serious risk of producing an accident; but this work formed no part of Jones' duty; it was the duty of the powder men to clean the tubs and generally to attend to their condition, and had Jones undertaken any work of this sort, he would not only have been acting in contravention of orders but he would also have been discharging a duty which belonged to somebody else. Moreover, I am assured by the leading hand, that the "small-set" (which was the only part of the machinery not in motion), did not at this time require any sort of cleaning.

I now pass to the second group of possible causes, viz., causes independent of tools and machinery; of these the first is,—

Lightning.

6. *Lightning.*—This may be at once dismissed, for it is an undoubted fact that there was no lightning at or near Faversham that morning.

Fire from external sources.

7. *Fire from external sources.*—The nearest chimney to the glazing house is that of the engine house, distant about 30 yards almost due east. As the wind that morning was as nearly as possible N.E. all possibility of fire being conveyed into the glazing house from this chimney may be dismissed, and there is no other chimney near the glazing house. The stove boiler chimney is over 100 yards away to the N.W., nor was there any possibilty of fire being conveyed into the house from any passing engine, for the very sufficient reason that no engine of any description passes near the house. No glue pot was ever required in the house, and the possibility of ignition of powder by the sun's rays at 9.40 a.m. in February, in a building having its windows all to the S., may be at once dismissed.

But when we proceed to inquire as to the possibility of fire having been conveyed from the engine house to the glazing house on the clothing of a workman, then I feel bound to observe we reach a very suspicious source of risk, and one the existence of which, it is my duty to remark, reflects unfavourably upon the management and system of this factory.

It is well known that the clothing of the workmen employed in the danger buildings of a powder factory becomes in time more or less impregnated with gunpowder dust, to an extent, in the case of those who work in the more dusty buildings, which very soon renders it a real danger for men so dressed to approach an open fire, a spark from which may ignite the powder-impregnated clothing and cause serious in-

* Messrs. Hall's Special Rule 9, and Extra Special Rules for repair.

juries, or even death. Several accidents of this sort have occurred, and in some factories it has been the practice to provide outside the watch house a large tank of water for the men to jump into should they catch fire. Messrs. Hall, however, have adopted in their watch houses (except those attached to the incorporating mills) the more excellent plan of heating by steam instead of by open fires; and I understand that this plan was adopted after some accidents which occurred some years ago through the men's clothing catching fire, or through a spark falling inside their shoes and exploding the powder dust which had fallen therein. Through what I cannot but regard as a most remarkable and unfortunate oversight, Messrs. Hall, while making this special provision as regards the watch houses, allowed the work of attending to the machinery of the glazing house, work which entails entering the house once at least daily in ordinary weather, and generally twice, if not more often, in colder weather,* to be performed by a man who also acts as engine man and stoker. This system prevails both at the Oare and the Marsh Works, and is, in my judgment, open to the very gravest objections. In the first place, it is open to the objection that it admits into a danger building a man whom the manager allows "is not recognised as a regular powder man," and who would not come under such direct supervision as to clothing as would be extended to the regular powder men;* secondly, and chiefly, it allows a man with clothing rendered more or less of the nature of touch paper to proceed direct from the furnace of his engine-room into a powder house, and *vice versâ*, thereby exposing the man to the risks which the steam heating of the watch houses was designed to avoid, and, more important still, affording an opportunity for the accidental bringing into the powder house of fire in the form of some burning clothing. The importance of this point has induced me to devote particular attention to it, and, as bearing upon the possibility of the accident having been caused in this way, the following considerations seem worthy of notice: First, it is a fact, as I ascertained by personal experimental observation and by inquiry, that the Welsh coal which is burnt in the engine furnaces of this factory readily gives forth sparks when stoked and raked and poked, and the sparks so given off are of a character to ignite clothing already predisposed to catch fire from being more or less affected by powder dust. Secondly, it is a fact that the clothing worn by the engine men get sufficient powder upon them from frequent use in the glazing house to assume the condition more or less of tinder. Thirdly. I have ascertained that even when washed, clothing once impregnated with powder retains its touch-papery character, and will continue to smoulder for a long time, and the same holds good when the impregnated clothing has become damp. Fourthly, such smouldering is not accompanied by any fizzing or noise, such as would at once attract the attention of the wearer, if by chance a portion of the back of his coat or trousers were burning; indeed, so silently does this smouldering proceed, that in the course of some experiments which I have carried out I have found it necessary to watch the samples, in order to ascertain if they went out.

Experiments with powder-impregnated clothing.

With a view to satisfying myself on the foregoing points, I obtained from one of the corning-house men at the Oare factory, a twilled fustian jacket which he was in the habit of wearing at his work, and with portions of this jacket I have made several experiments; Dr. Dupré, F.R.S., has also made some experiments. I found that pieces of the stuff an inch square smouldered three or four minutes, and even longer; the same stuff when washed smouldered over five or six minutes; some pieces went out when not placed in a current of air, others burnt almost entirely away, even when laid on a flat iron surface. When the unwashed material was damped to imitate the effect of rain its rate of burning was slightly retarded, that is all. It still burnt with the same tinder-like character.

Dr. Dupré, for the purposes of his experiments, took three pieces, each 1 inch broad and $2\frac{3}{4}$ inches long. One piece was burnt without washing, and took $4\frac{1}{2}$ minutes to consume; a second piece was washed (a little) under a tap and redried; it burnt for eight minutes; the third piece was placed under a bell jar with water for a whole night, and when set fire to was damp to the touch, it burnt 10 minutes.

In short, it appears from the above that the washing or damping of the powder-impregnated clothing would actually, if anything, be rather favourable to the conveying of fire, because it would tend to make the stuff assume more distinctively the character of tinder, burn more temperately, and so be less likely to attract attention to the fact of its having become ignited.

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* In colder weather the possible thickening of the oil calls for more frequent attention.

† It is proper to remark that the engine-men appear to have been in the habit of wearing clothing without pockets (like powder men), and I shall show that there are grounds for believing that this regulation was observed by the deceased.

Whether this accident was actually caused by the unfortunate man Jones passing into the glazing house with some portion of his clothing, which had become ignited by a spark from the furnace, smouldering upon him, we shall never know for certain; but this possible cause does appear to me to take its place among the more probable explanations of the explosion. As favouring this view we have the facts that all the elements which go to create this risk were undoubtedly present on this occasion, while it is almost certainly the case that if the deceased actually entered the house at all about the time of the explosion, he must have done so only *just* before, for the boatman, Mannock, is confident that Jones was not in or at the building when Mannock was there five minutes before the accident. As opposed to the probability of the accident having been caused in this way, there is the strong doubt as to whether Jones was present in the house at all when the explosion occurred. That he was unfortunately either in or close to the house (perhaps oiling the machinery outside) when the explosion took place, the condition of his remains only too surely testifies; but there are two circumstances in connexion with his remains which seems to me to justify a very strong doubt as to his having been actually inside the house. First, that almost the only parts of the unhappy man's body which were found intact were his feet, which were picked up almost uninjured, in a S. direction, distant about 100 to 150 yards. I am disposed to think it probable that had the man been standing actually inside the house, the feet would not have been recovered thus intact, and at so great a distance. They would surely rather have been lost in the crater, or entirely destroyed.

Secondly, the fact that the remains were all blown in a S. direction seem to point unmistakably to the fact that he was behind the glazing tubs rather than among them or in front of them, and taken in conjunction with the observation above as to the recovery of his feet, this would tend to strengthen the belief that he was more probably outside and behind the house than inside when the explosion occurred.* The indications as to the exact whereabouts of the deceased are, it is true, slight and imperfect, but such as they are it is important to call attention to them, because they bear upon the question of the degree of probability attaching to the possible conveyance of fire on the man's clothing having caused the accident, and upon the even graver question, which it will presently be my duty to discuss, of whether the accident is likely to have been due to some intentional act on the part of the deceased.

In any case, it is evident that Messrs. Hall had negligently allowed to remain open an avenue of most dangerous approach, which it behoves them now that their attention has been especially directed thereto promptly and effectually to close, by making such arrangements as will ensure that workpeople who have to enter powder houses shall not pass to and from any place in which there is an open fire.†

Sparks.

8. *Sparks.*—Sparks from some article of iron always constitute a possible risk in a gunpowder factory if iron articles be not scrupulously excluded. But having inquired very fully into this point, I see no reason to believe that there was any probability of iron articles (other than certain parts of the machinery) having been present.

In the Oare glazing house there are, it is true, some exposed iron nuts and bolts in the roof, which I have requested Messrs. Hall to leather over or remove. I believe the construction of the Marsh glazing house was identical; and if so, the presence of these exposed iron nuts was objectionable, not merely because the fall of one on to some iron portion of the machinery might create a spark,‡ but because the presence of uncovered iron in a powder building is inconsistent with the provisions of sec. 10, §. 2, of the Explosives Act, 1875.§

Although, however, we cannot confidently dismiss this from the catalogue of possible causes, it is not, in my opinion, one to which under the circumstances any very high degree of probability attaches. As to articles of iron brought into the house, if, as I believe, the regulations as to pockets are observed, this could hardly occur. The possibility of a spark having been struck from some articles of glazed earthenware is negatived by the fact that no such articles were in this building or could be required for

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* I also hold that it is almost impossible that he could have been *entering* the house, as in this case, the entrance being at the N.E. corner, his remains would almost certainly have been projected to the E. or N.E. and thrown on to or over the traverse which separated the glazing house from the engine house.

† Messrs. Hall have informed me, while the preparation of this Report has been in progress, that they have so altered their arrangements as to remove this cause of objection.

‡ See p. 13 as to an accident having occurred at Messrs. Bickford Smith and Co.'s Fuze Factory at Tuckingmill through the fall of an article on to iron.

§ "The interior of every . . . . . danger building, and the benches, shelves, and fittings in such buildings (other than machinery) shall be so constructed or so lined or covered as to prevent the exposure of any iron or steel in such manner, and the detaching of any grit, iron, steel, or similar substance in such manner as to come into contact with the gunpowder or ingredients thereof in such building."

use therein. As the weather was wet and snowy, it is almost physically impossible that the ignition of powder dust outside the house (even if we assume a glazing house to be a dusty house, which it is not) could have caused the explosion.

Ignition of cotton-waste.

9. *Spontantaneous ignition of cotton-waste.*—I do not think it is worth while to enter into a serious discussion as to the possibility of the spontantaneous ignition of oiled cotton-waste in a house without any fire in it, on a snowy morning in February, but if it were, it would be almost sufficient to point out that by one of Messrs. Hall's special rules, cotton-waste is forbidden to be taken into the powder house and only sponge cloths are allowed to be used, two of these only being provided at one time, and clean ones supplied daily (special rule 15), and more than one witness bore testimony to the fact that there never is any cotton-waste in the glazing house.

10. *Smoking.*—This may be dismissed from the list of possible causes. Apart from the fact that Messrs. Hall strictly prohibit smoking on any part of the works even at the watch houses (Special Rule 2), and that this is pre-eminently one of those regulations which, on account of the facilities for detection and other reasons, is not likely to be transgressed, there is the further fact established by several witnesses, including a son of the deceased, that Jones never smoked; and as he was the only man at the house within five minutes of the explosion the possibility of the accident having arisen through smoking, or an unextinguished pipe in a man's pocket, may be dismissed.

Lucifer matches.

11. *Lucifer matches.*—I think it unlikely that the accident arose from the presence of a lucifer match. First, because the matches supplied (by the Firm) for the use of the engine-men were "safety matches," which ignited only on the box; secondly, because there are strong grounds for believing that Messrs. Hall's rule prohibiting the wearing of pockets is one which is generally observed. As regards the man Jones there is no doubt that he had provided himself with a suit of pocketless clothes for his work,* and that he kept these at the engine house, and washed them there when they required it. It is also a fact that since the explosion the clothes which he wore to and from the factory have been recovered, and none of his working clothes, justifying the inference that when he was killed he had his regular working clothes upon him; but eight or nine other men had been in the house that morning, and I have not found it possible to ascertain in a way to place it beyond all possible doubt whether all these men had on pocketless clothing, or whether by one or more of them the regulations may have been transgressed, in which case a match brought from their homes might have fallen from the pocket. The responsibility of seeing that the men were properly dressed appears to have rested upon the foreman of the factory (Honess)† and, as already stated, I have reason to believe that this regulation is generally attended to; but I do not find that it was Messrs. Hall's practice to require the foreman to make any daily report as to his having personally discharged this duty; indeed, when I first commenced my inquiry I had some little difficulty in ascertaining exactly who was the responsible person. The manager at first appeared to think that the leading hands of houses were responsible, but the leading hand of the glazing and corning house said the duty had not been assigned to him, and although probably Honess in a general way looked after this matter, I have been unable to satisfy myself that the duty was discharged with unfailing and constant vigilance, and I am disposed to believe that it had become at any rate little more than a form to which no very special attention was directed. Indeed, that this regulation has not always been strictly acted upon is evident from the fact that in the course of an inspection of this factory on the 19th May 1877, I found a man at work in the blasting-cartridge house with pockets in his trousers, a circumstance which he explained by stating that he had put on this pair by accident; and this suggests the further observation that Messrs. Hall would do well either to provide their men with working suits of a uniform pattern and appearance, which it would not be open to them to remove from the works or to replace with clothing of their own, or if they are disinclined to adopt this course, that they should require all articles of clothing worn by the men to be submitted for approval and marked with some distinguishing mark, before being taken into wear in the powder buildings. This, coupled with a system of regular inspection by a responsible foreman, to be followed (as is done by Messrs. Curtis and Harvey) by a daily written report of the inspection having been actually carried out, would provide such safeguards for the proper and invariable observance of this most important rule as do not in my judgment exist at present.

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* The manager stated that Jones was not required to wear pocketless clothing, *i.e.*, he considered that Messrs. Hall's 11th special rule did not apply to a man in Jones's position. I do not agree with the manager as to the application of this rule; as worded it forbids any one wearing in any powder house (whether for a long or short period) clothing with pockets, and in providing himself with such clothes, Jones undoubtedly acted prudently.

† Honess has been ill since the explosion, and I have been unable to examine him.

As regards the possibility of matches having been left lying about by some trespasser on the factory, this is, I think, sufficiently disposed of by the fact that Messrs. Hall keep two watchmen on the works nightly and on Sundays (*i.e.*, whenever the workpeople are not about), and that the watercourse is too wide at this part for a trespasser readily to get over it.

On the whole, I consider that there is no sufficient warrant for suspecting that this accident was caused by the presence (from whatever source) of a lucifer match.

Foreign substances.

12. *Foreign substances, such as stones, gritty particles, &c.*—This group of risks is a very wide one, and I should be extending this Report to a disproportionate length were I to attempt to deal in detail with all the evidence and considerations which are forthcoming in reference to the possible presence of risks of this description. I will therefore content myself with observing that, even if gritty particles were present, the risk of accident from this cause does not attain any very marked prominence in a glazing house, especially when, as in this case, the floor of the house is covered with hides. Also, although a metal nut or other hard body which might fall in among the powder would be a certain element of risk, and one which it is most desirable to eliminate, it does not present itself to my mind as one of the most likely sources of an accident of this class as it would in a corning or press house. Moreover, a very minute and, as far as practicable, exhaustive inquiry into this branch of the subject satisfies me that the precautions taken by Messrs. Hall to exclude foreign bodies from the semi-manufactured powder are generally of an elaborate and satisfactory character. The "clean" floor system, *i.e.*, the system of a well-defined boundary at the commencement of each powder floor or platform, beyond which the gritty boot never passes, and outside which the powder boot never steps, is, so far as my observations at my inspections have gone, generally scrupulously carried out;* and the rules provide specially as to this (Special Rule 4), and also forbid the turning up of the trousers at the bottom (Rule 11). The tools are also carefully deposited in places where they are unlikely to take up grit; open barrels are not allowed to be placed one in another (Rule 12); the boats are kept clean, and as the weather was wet and snowy it is unlikely that any grit should have blown in on this occasion; the ingredients are carefully sifted before use (as required by sec. 10, § 13), the brimstone through a 36-mesh sifter, the charcoal through a 72-mesh, and the saltpetre through the canvas strainers, in the process of refining; moreover, if from any neglect or failure the exclusion of foreign bodies from the ingredients were not to be thoroughly accomplished, it is almost inevitable that this neglect would have declared itself, either by causing an explosion or by the foreign substance being discovered in the mills, press house, or corning house, all of which processes precede the glazing; indeed, it may be affirmed with confidence that if a foreign body had passed in the semi-manufactured powder through the earlier stages, it would be in the last degree unlikely to cause accident in the process of glazing; the walls and roofs of the large powder buildings † are of wood, from which no grit could fall, while the chance of one of the unleathered nuts, upon which I have before remarked, falling into a glaze-tub or into the powder before it is placed in the glazing tubs, is, I consider, exceedingly remote; there was nothing inside the glaze tubs themselves which could by getting among the powder cause accident, and as the powder is covered over during transit, and does not after leaving the press house pass under any masonry bridges, and as the wooden bridges are furnished with protecting wings, to prevent pebbles and dirt from falling from them into the boats, it is difficult to see how grit could reach the ingredients or the clean portions of the boats in transit.

I am aware, of course, that even the most perfect system is liable to occasional failure; and that, for example, despite the exceptionally elaborate precautions which are adopted in the Government establishments, extraordinary instances of dangerous foreign bodies finding their way into semi-manufactured powder have occurred;‡ and in view of this fact I am not prepared to say that no foreign body could have been present among the powder or on the floor to cause this explosion. But I feel warranted

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* I have had occasion to complain of what I regarded as imperfections in this system in respect of the "mill charge houses," which until recently were not kept "clean," and at a recent inspection I called attention to the fact that some alterations were required in the "blasting-cartridge house" to ensure the effective working of the system. These defects however have been rectified, or were in process of rectification; and there was nothing to complain of in this respect in the large working powder houses.

† A portion of a gable of one of the factory magazines over a "clean" platform was found by me at a recent inspection to be of unprotected masonry, and I called upon Messrs. Hall to rectify it by facing it with wood or otherwise, but this could not affect powder in the glazing house.

‡ See Appendix 19 to the Report of the Parliamentary Committee on Explosives, 1874, p. 366, for a list of the various articles which have from time to time been found in Government powder, *e.g.*, large stones in the press cake, pieces of iron, nails, &c., and even a lucifer match, and a friction tube, which were found in the barrels of powder in the Government Establishments.

in expressing my opinion, after a most searching examination of Messrs. Hall's precautions for the exclusion of grit, that their system as a whole seems well fitted to accomplish the object which they have in view, that it does not present any point of special suspicion, and as even the presence of such foreign bodies as this system is designed to exclude would not in a glazing house constitute a risk of the marked character that it would assume in a house where the powder is being ground or crushed or pressed, it appears a reasonable conclusion that this accident was not caused by any grit or dangerous foreign substance present in the powder or in the building.

Wilful acts.

The last group of risks with which I have to deal is composed of risks arising from a wilful act. With regard to the possibility of the explosion having been effected by some malicious person, I hope this may confidently be dismissed. The evidence which I have been able to obtain seems to point unmistakeably to the fact that there is no warrant for suspecting any ill feeling on the part of any person in the neighbourhood which would be likely to prompt to so diabolical an act; and seeing that Messrs. Hall always keep watchmen on the factory when the workpeople are away, by whom a trespasser would be readily seen and removed, while the waterways of the factory present an obstacle of no inconsiderable character to the unlawful entry of the factory at this part, the accomplishment of any such malevolent design as the introduction of matches or of foreign substances into the powder at this house would be a task of no common difficulty except to a person regularly employed on the factory. As regards the workpeople, the manager (Mr. Whiting) states very emphatically that there has not to his knowledge been any bad feeling among them, there has been nothing of the nature of a strike, no reduction of wages, no movement for an increase of wages, and, with the exception of a boy who was discharged from the Oare works for laziness, there has been no recent case of dismissal or discharge of workmen. In short, Mr. Whiting assures me that he knew no reason whatever for suspecting the existence of any ill feeling either inside or outside the factory.

Suspicion attached to possible acts of insanity.

But in the course of the inquiry it transpired that the unfortunate deceased was in December last under medical treatment for (to adopt the exact words of Dr. Gange who treated him) "aberration of mind."* It assumed, said Dr. Gange, "the form of a "mild kind of delirium tremens, with delusions and a constant busy looking about for "things which did not exist." Dr. Gange had known the man for 11 or 12 years, and knew that he was a very sober man, and that the attack could not therefore have been the result of drink. And he concluded that the delirium had been produced by the intense cold, other of his patients having been similarly affected during this winter. Dr. Gange says that the man perfectly recovered (to all appearances) in about a week, but he advised him to remain at home a little while, during the prevalent bad weather, with a view to thoroughly recruiting his strength. The doctor says that he did not consider the man's condition rendered it necessary for him to make any communication to the Firm. Jones appears to have acted upon the doctor's advice, and to have remained away from his work until the 28th December. Since his return to work, although his duties are said to have been always punctually and faithfully performed, his gloominess and apparent despondency appear more than once to have formed the subject of comment among his fellow workmen. The man was no doubt constitutionally of a phlegmatic and reserved disposition, but those who were in the habit of meeting him at his daily work have noticed and remarked to one another on his increased taciturnity and want of cheerfulness. One man says that since his illness he "never saw a smile on his face;" that he gave him the impression of a man "who was not happy," and in reply to my inquiry he asserts distinctly that he "saw a change" in the man. Another fellow workman who had known Jones for 32 years informed me that "he had not been the same man" since his illness, and that the change had taken the form of "low spirits or dullness."

It is also stated that his nervous system had received a severe shock at the time of the great explosion of 1867, when he was buried in the ruins of the engine house, from which position he was extricated by his son. On the other hand, the stoveman (Lewis), who knew Jones well, says he had observed no difference in him since his illness; and his son who formerly worked with his father in this factory, and is now employed as a fireman on the London, Chatham, and Dover Railway, says that he had perfectly recovered before he returned to his work, and was in all respects the same after his illness as before, and that when he went to his work the morning before the explosion†

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* Mr. Watson Smith stated at the inquest that on the day of the explosion Dr. Gange had used stronger language in conversation with him and had spoken of the man having been "off his head for some time" and of his having become "clean silly" (or words to that effect).

† The explosion occurred on a Friday; Jones went to work on Thursday morning, and remained on duty throughout that day and night up to the time of the accident.

he was in good health and in his usual spirits. It is also noticeable that the men who deemed that Jones was a changed man had not (as one would have thought they would most probably have done in the interests of their own safety) made any representation on the subject to the manager or to any person in authority, whence it may be inferred that the change in his conduct and manner was not in their judgment of such a character as to suggest any suspicion that it was undesirable to continue to allow him to have access to powder buildings.

It has been suggested that there were circumstances in connexion with Jones' domestic life which were likely to affect his peace of mind, and a somewhat general impression to that effect appears to prevail. It was acknowledged by Dr. Gange that the existence of some constant source of irritation and depression might have the effect of bringing on another attack. The son, however (who lived with his father), denies that there existed in their home any special cause of mental distress or disturbance, and assured me that he was unaware of any domestic annoyance, pecuniary or other, which would have been likely to upset his father's peace of mind. It is right to state that this opinion is distinctly opposed to the view which appears to be generally entertained by those who knew Jones and his home, but in the absence of more specific evidence as to the causes of domestic unhappiness which are commonly alleged to have existed, I conceive that I should scarcely be warranted in referring to them more particularly.

The facts remain, first, that the man, whose nervous system is said to have received a severe shock in an explosion some years ago, was temporarily mentally disordered a little more than two months before the accident, that he had been compelled to remain away from his work until the end of last year, that during the interval between his resuming work and the explosion his change of disposition and marked dullness and apparent despondency had excited remark among his fellow workmen.

Having regard to the fact that the special glazing house rules are so few, and the instances of explosion of such houses so exceedingly rare, it is scarcely surprising that an impression should have obtained among some of those who are interested in ascertaining the true cause of the explosion, that it was the result of an intentional act on the part of the deceased, in a moment of renewed mental disturbance or on the crisis of some fit of despondency.

In opposition to the suggestion that the explosion was caused in this way, it is proper to remark that had Jones desired to blow up the house he would, no doubt, have attacked the powder standing in the sixteen open barrels awaiting glazing. To have adopted any other course would have been to go to work in a clumsy, roundabout, and possibly ineffective way. But with sixteen open barrels of powder standing just inside the house, a man coming straight from a furnace would have no difficulty in causing an explosion. But had he caused it in this way, I am of opinion that as all the explosion * would have occurred to the S. or W. of him, his remains must have been projected N. or E. As it happens, however, no single portion has been found in either of these directions, but all in a due S. line. And, as before observed, had he been standing in the house or about the N. side of it, it is difficult to see how his feet could possibly have been thrown uninjured 150 yards to the S.

Whether the explosion was actually so caused is a point which it is unlikely will ever be satisfactorily cleared up, but it must always remain as one of the suspected causes.

Blame attaching to Dr. Gange for not communicating the condition of Jones to the firm.

And in any case it seems to me that no small blame attaches to Dr. Gange for not having promptly signified to Messrs. Hall the condition of his patient when he found that his mind was affected in December last. No doubt Dr. Gange considered that before the man left his hands he was entirely recovered; he considered also that the special causes which had produced this temporary aberration of mind had disappeared; and he saw no reason to doubt that Jones would be able (particularly after a little rest) to discharge his duties as before; he also says he did not know he had to go into a powder building. But, on the other hand, there was the fact that the man, constitutionally phlegmatic, with "a tendency to melancholia and despondency," had been temporarily mentally incapacitated; there also existed, according to Dr. Gange's belief, and according to the statement made to him by the man's son, elements of domestic unhappiness and depression, such as he states would be liable to aggravate any infirmity in Jones' "mental condition," or, if continued, to produce mental derangement; and it is to me almost inconceivable, and must ever remain a subject of deep regret, that Dr. Gange, knowing as he did that the man was employed in a powder factory in some capacity, did not communicate with the Firm his observations as to the man's past,

* I say "all the explosion," for he would no doubt apply the fire on getting up to the barrels. These would explode, and instantly communicate to all the powder in the glaze tubs further inside the house.

present, and possible condition, and leave them to judge how far it was desirable that he should be continued on work which took him into danger buildings.

What Messrs. Hall's decision would have been had the actual condition of affairs been made known to them, admits of no doubt, and in reply to my inquiry whether, had they known what they know now they would have continued Jones in their employ, Mr. Smith, the resident partner, stated most emphatically that had he known what Dr. Gange has told him since the accident and what he now knows, the man would most certainly not have been continued in their employment in any capacity.

The coroner censured Dr. Gange for not having communicated with the Firm as to the man's condition, and said that even on the grounds of common humanity, having regard to the large number of people employed in the works, he would have thought that Dr. Gange would have informed the Firm as to the man's condition. In this view I decidedly concur.

I am of opinion that measures should, for the future, be adopted which will secure that the Firm shall have a medical certificate as to the cause of sickness of any man who may be absent from his work, and also that it should be an instruction to the work-people at once to bring under the notice of the foreman or manager anything unusual which they may observe in the conduct or appearance of a fellow workman.*

The three most suspicious causes.

Having now most fully examined the various possible causes to which this accident may be attributed, and having eliminated those to which little or no degree of probability attaches, I find that there remain three causes of a prominently suspicious character:—

1st. The breaking of the tub-shaft of one of the glazers.

2nd. The ignition of some powder by fire accidentally conveyed into the house on the tinder-like clothing of Thomas Jones.

3rd. The intentional explosion of the house by Thomas Jones while in a state of temporary insanity or excessive despondency.

In estimating the relative degree of probabilty attaching to these three probable causes, it is important to revert to what has already been said on the question of the actual whereabouts of Jones at the moment of the explosion.

Intrinsically the three suggested causes are on about the same level of probability, but if it be a fact that Jones was not in the house at all when it exploded, then it would seem to follow that the first named of the three, viz., the breaking of a shaft, must be the true cause. Obviously, if Jones had desired to commit suicide, he would not have been likely to have applied the fire to the house while he was *outside* of it; and as to the accidental explosion of the house by fire conveyed thereto on the clothing, this cause would, in my judgment, disappear from those of reasonable probability if it could be shown beyond doubt that Jones was outside when the explosion actually occurred. But whether he was actually inside or outside must ever, I fear, remain to some extent a matter of doubt and conjecture, and as long as that doubt remains, so long must suspicion attach to all three of the causes above named. Remove that doubt, and two out of the three probable causes disappear, and leave us with the broken shaft as the most reasonable explanation of the accident. And seeing that the balance of considerations appear distinctly to incline to the strong probability of the man having been outside the house when it went off, if, indeed, it may not be said that the presence of the man in the house is physically inconsistent with observed results as to the character and direction of the recovered fragments of his body, I am of opinion that the true explanation of the accident is most probably to be found in the accidental breaking of a shaft during the working of the house. The evidence was not such as to admit of the jury finding decisively the cause of the explosion, and they returned an open verdict, after a very full and patient investigation of the whole case, and after I had laid before them the various possible causes with the surrounding considerations.

Conclusion as to most probable cause of accident.

The following points appear to call for attention:—

General observations.

1st. The importance of surrounding buildings, which in the course of working are liable to contain very large quantities of gunpowder, with substantial traverses, especially when, as in this case, villages and houses have become established in the vicinity of the factory. In this instance we have seen the value of traverses in protecting the corning and press houses against explosion, and I believe that had this glazing

Importance of traverses.

* In some Special Rules this is expressly enjoined, and I am informed that at Waltham Abbey the powder men are generally most prompt in calling attention to anything which they consider arises in the conduct or appearance of a fellow workman.

house been surrounded by good mounds the loss entailed on Messrs. Hall by the destruction of their property, and the damage done outside the factory, would have been considerably reduced. On the other hand, had the house contained at the time the very much larger quantity of gunpowder usually present therein, or the quantity which was actually present therein about five minutes before the accident, or the quantity which in another 10 minutes would have been there, the effects produced outside as well as inside the factory would, in the absence of protecting mounds, undoubtedly have been largely increased, and it is reasonable to believe would have probably entailed the explosion of other buildings with increased loss of life.

Importance of avoiding heavy or resisting constructions of powder houses. Desirability of substituting metal (wood cased) for wooden shafts.

2nd. The inexpediency of adopting a strong resisting construction for working buildings was exemplified by this accident, the very extensive effects of which were, I have little doubt, intensified by the heavy tank roof, and it would seem desirable to substitute for the wooden glaze-tub shafts, shafts of metal, wood-cased; and it is also for consideration whether the shafts should not either have a central bearing, or be made shorter, by imposing upon each only one tub.

Powder men should not be allowed to enter rooms having open fires in them.

3rd. It is certainly important to provide against men whose work calls upon them however occasionally to enter a powder building, from being allowed also to enter buildings in which there is an open fire, not merely as a precaution against the carrying of fire into the powder house, but to protect the men themselves from the consequences of the accidental ignition of their powder-begrimed clothing.

Desirability of improvement in system of inspecting clothing.

4th. I am of opinion that Messrs. Hall would do well to strengthen their system for securing the strict and invariable observance of the rules as to clothing; and, I believe, they would best do this,—

(*a.*) By making some competent man responsible for the daily personal inspection of all those persons who have to enter powder houses or boats, and by requiring the person so appointed to sign a daily certificate that the duty had been duly performed; and

(*b.*) By either providing each powder man with a suit of clothing of uniform character, which he would be forbidden to remove from the factory, or by requiring every man to submit for inspection and approval such of his own clothing as he proposes to wear on powder work, the clothing so inspected and approved to be marked with some distinguishing mark.

Workman on sick list should produce medical certificate.

5th. In view of the circumstances connected with the state of mind of the unfortunate deceased, it is desirable that the Firm should take such steps, by way of a medical certificate or otherwise, as they may deem expedient and sufficient, to ensure that no man who has been under treatment for aberration of mind, or has otherwise exhibited symptoms of insanity, however transitory, should be allowed to resume work without the express sanction of the Firm; also that the workpeople should be instructed at once to bring under notice any special peculiarity in the conduct or appearance of their fellow workmen which they may observe.

Importance of limiting quantities of powder even in the less dangerous buildings.

6th. This accident illustrates a point upon which it has not unfrequently been my duty to insist, that it is not prudent to rely upon the comparative immunity from risk of particular powder buildings to accumulate therein excessive quantities of powder. As already stated, a glazing house is usually regarded as one of the safest of the buildings in a gunpowder factory. Only one previous accident, and that not strictly connected with the house as a glazing house, is recorded as having originated in a glazing house, and I have more than once been met on the part of manufacturers, when remarking upon the large quantities present in a house of this description, by the observation that after all the house is so very safe that no practical apprehension need be entertained.

The complacent acceptance of the theory that in such comparatively safe buildings as glazing and dusting houses, objections to the accumulations of large quantities of powder are really theoretical, and ought not to prevail, can hardly fail to be somewhat disturbed by this very serious explosion, and by the light which the inquiry has thrown on the possible existence even in buildings of this class of a large number of working and other risks. My views on this subject found official expression in a memorandum which, in 1873, I addressed to some of the leading houses in the trade, headed "Memorandum on the Accumulation of Powder in Dusting and Glazing Houses," and which will be found in the Report of the House of Commons Committee on Explosives, 1874, pp. 79, 80. And I venture to claim for the present accident that it has illustrated in a very marked manner the soundness of the views which I then expresed. The accident has been serious enough as it is, when the quantity of powder present was only equal to the actual working power of the house; had there also been in deposit the large extra quantities which manufacturers in some instances, and in opposition, I regret to say, to

strenuous remonstrances,* have too often been in the habit of accumulating in these buildings, the consequences would probably have been of a most terrific character, and the explosion might easily have attained the unpleasant distinction of being the worst ever recorded as having occurred in an English gunpowder factory.

In conclusion, I have only to add that I have received from Messrs. Hall and their manager every assistance in conducting my inquiry. I have placed myself in communication with them with regard to the various points rising out of this inquiry to which it has seemed to me desirable their attention should be called.

I have the honour to be,
Sir,
Your obedient Servant,
V. D. Majendie, Major R.A.,
H.M.'s Chief Inspector of Explosives.

The Right Hon.
The Secretary of State,
Home Department.

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* The quantity in a glazing house is not limited by statute.

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REPORT

TO

THE RIGHT HON. THE SECRETARY OF STATE FOR THE HOME DEPARTMENT,

ON

The Circumstances attending an Accident by Explosion, which occurred in Mr. Macdonald's War Rocket Factory, at Whitehill, near Gravesend, on the 13th September 1878;

BY

MAJOR V. D. MAJENDIE, R.A.,
H.M. CHIEF INSPECTOR OF EXPLOSIVES.

Presented to both Houses of Parliament by Command of Her Majesty.

SIR, Home Office, September 30, 1878.

I HAVE the honour to report that in obedience to your Order of the 21st instant, made under the 66th section of the Explosives Act, 1875, I have held an inquiry into the circumstances attending an accident by explosion, which occurred on the 13th instant, in a War Rocket Factory at Whitehill, near Gravesend, occupied by Mr. John Macdonald, by which two men received injuries.

In accordance with the provisions of the above-mentioned section of the Act, I beg to render the following Report:—

Description of factory.

Mr. Macdonald's factory was licensed under the Explosives Act, 1875, on the 13th December 1876, License No. 11. The factory is numbered 66 on our books. The explosive authorised to be manufactured therein is war rockets, which are described in the license as "War Rockets, not containing their own means of ignition, consisting "of cases of iron, or other suitable material, containing rocket composition consisting "of an intimate mixture of saltpetre, sulphur, and charcoal." The factory consists "of two principal parts, the working buildings and the factory magazine, the former being entirely separated from the latter, from which they are distant over 150 yards, and being surrounded by a fence. The main working building consists of four compartments, lettered on the plan respectively (*a.*), (*b.*), (*c.*), (*d.*). The two first compartments are of brick, with tiled roofs, and lined throughout with wood, the compartments (*c.*) and (*d.*) forming each a sort of wooden lean-to against the compartments (*a.*) and (*b.*)

There is another working building (numbered 2) at about 3 feet behind the compartment (*c.*), and screened by means of a wooden screen.

The operations assigned to the several compartments and buildings, and the limitation in the quantity of composition and number of work-people, are laid down in the Schedule to the license as follows:—

Building or Compartment.	Process to be carried on.	Explosives which may be present.	No. of Work-Persons.
1 (*a.*)	Filling and pressing rockets with composition and preparing rockets for heading.	Rocket composition in and out of rockets, in all 20 lbs.	5
1 (*b.*)	Ditto - -	Ditto 40 lbs. - -	7
1 (*c.*)	Heading and riveting rockets after pressing.	Ditto 20 lbs. - -	1
1 (*d.*)	Boring composition of rockets, but this operation is not to be carried on at the same time as any operation is being carried on in (*a.*) or (*b.*)	Ditto 20 lbs. provided that the quantity in the whole building, No. 1, is not to exceed 60 lbs. at one time.	2: Provided that the number in the whole building, No. 1, is not to exceed 12 at one time.
2	Painting and packing war rockets -	War rockets containing of composition 250 lbs.	2

[C.—2219.] *Price* 1*d.*

It will be observed that the quantities were strictly limited, with a view to the prevention, as far as practicable, of the extension of the effects of an explosion from one compartment or building to another, and so far as this particular accident is concerned this result has been achieved.

There can, however, be no doubt that the distribution of the buildings is not altogether satisfactory. They are too much huddled up together. I felt this when I was called upon to advise upon the original application for a license; bnt I felt that, although the proximity of the various working departments was unsatisfactory, it would not justify the rejection of the proposition, provided that by means of a limitation of quantities and the interposition of walls and screens a reasonable security against an explosion extending from one department to another could be obtained. The present accident shows that the margin of security is a very narrow one, and that the limitations enforced by the license have erred, if at all, on the side of insufficient rather than of excessive stringency, for although the effects were happily confined to the compartment in which it occurred, those effects were produced by a quantity of explosive considerably below the maximum allowed for the compartment, and the structural injury to the compartment is considerable and only just stopped short of making its mark upon the compartment (*d.*) adjoining that in which it occurred.

Circumstances attending the accident.

The accident occurred at about 9 a.m., on Friday 13th instant, in compartment 1 (*a.*). I received notice of the same on Saturday 14th, and proceeded (with Mr. Macdonald) on the 16th to the factory, which had been left *in statu quo*. I also examined one of the injured men (Heaver) at the Gravesend Infirmary. It appears from the statement of the man Heaver, and from my own observations on the spot, that the accident occurred as follows:—

Heaver and the foreman (Gunn) were engaged in pressing a 12-pr. war rocket. They were the only persons engaged in the factory. Mr. Macdonald had an order for six rockets of this description, five of them had already been pressed (the previous night), and they were commencing on the sixth when the accident occurred. The operation consists in pressing a quantity of rocket composition consisting (for this size of rocket) of—

Saltpetre	-	70 parts.
Sulphur	-	16 ,,
Charcoal	-	23 ,,

into a steel cylindrical case, the case having previously been wiped out and greased internally. To enable the pressing to be effected, a hand-hydraulic press, "Bramah's Patent" is employed, the rocket case being placed on a sort of movable table over the head of an hydraulic ram and connected therewith, an iron drift being inserted into the case on the top of the composition, and the pressure being obtained by the rising of the rocket on the table, the head of the drift being against a fixed piston on the upper part of the press. The hydraulic pressure is applied by means of hand-pumps, the handles of which are in the same compartment and distant about 9 feet from the press. One rocket only can be pressed at one time by the same press. There are two presses in this compartment, only one of which was at work at the time of the accident.

For the process of pressing five drifts of different lengths are employed, the longer drifts being used at first, and shorter drifts being substituted as the rocket case becomes more and more filled. The composition is introduced loose, 6 ounces at a time, but the first charge in each rocket is a double charge of 12 ounces. Sufficient composition is brought from the magazine in a wooden box to carry on the work (subject of course to the limitations expressed in the license). The box of composition, so brought, stands on a table to the right of the press. At the time of the accident the first charge had been inserted in the rockets, the first (or longest) drift was being used, and the two workmen were engaged in pumping at the press. The pressure on this charge was all but complete, the last final strokes were being given, when the rocket under pressure exploded with great violence, the explosion split the cast iron mould (the sides of which are two inches thick) in half, the halves being projected with great force against opposite corners of the building, the composition in the box (stated to have been from four to six pounds) was ignited at the same moment, and the two workmen were scorched, and one of them (Heaver) sustained a slight fracture of the skull from some piece of projected débris, or, as he believes, from some portion of the roof falling upon him.

Nature of structural injury.

The compartment itself was considerably injured. The end wall was almost entirely thrown down, the wood-work lying against it. The front wall was more than half down, These walls were of one brick thick only, and were of a light unsubstantial character. The roof was entirely destroyed, except some portions of the wood casing. The wall

between 1 (*a*) and 1 (*d*) had sustained some injury by way of shaking, but the wood lining had kept it up, and a person in compartment 1 (*d*) would not have been injured.

The wall between 1 (*a*) and 1 (*b*) was wholly uninjured. Compartment 1 (*c*) and building 2 had sustained no injury. Nor had the effects been sensible in the office and store, which stand apart from the working buildings, but inside the fence.

The extent of the damage sustained by compartment 1 (*a*) is shown by the accompanying photograph.

Probably the large amount of structural injury was due to the heavy blow struck by the half mould against the end wall (of which there were strong marks), and which no doubt came almost at the same moment as the explosive effect of the fired composition on the front wall, close to which it stood, and on the wood-work of which it had produced marked scorching effects. These two walls, themselves of very unsubstantial construction, thus each received a strong internal blow or thrust in directions tending to drive them apart, and when they fell, or partially fell down, the roof, being no longer supported, necessarily fell in.

Under the circumstances it must be acknowledged that the two workmen escaped with very much slighter injuries than might have been expected, having regard to the havoc and violent disruptive effects with which they were surrounded.

The cause of the accident now remains to be considered.

Considerations as to probable cause of accident.

Owing to the accident having occurred while the pressure was actually being applied, the number of possible causes is reduced to comparatively few. In investigating accidents by explosions, there are commonly a vast number of possible causes, of which the less probable have to be eliminated by a gradual process of examination and reasoning. But in this case, it is, I think, evident that the accident must have been due to friction generated in the interior of the case of the rocket under pressure.

Summary of possible causes.

It appears to me that the causes to which such friction might be due can be classed under the following heads :—

(1) Misfit of drift due to,
  (*a*) Incorrect relation of case and drift.
  (*b*) Injury to case or drift.

(2) Oblique thrust of drift, due to,
  (*a*) Crooked case or drift.
  (*b*) Want of truth in press.

(3) Foreign matter,
  (*a*) In the case or on the drift.
  (*b*) In the composition.

(4) Fracture of rocket case.

(5) Clogging of composition between the drift and the case.

It is necessary to examine each of the possible causes.

1. *As regards friction due to—*

Friction due to incorrect relation of case and drift.

(*a*) *Incorrect relation of case and drift.*—I have had one of the 12-pr. rocket cases taken at random from Mr. Macdonald's stock, and the identical drift which caused the accident carefully examined in the Royal Laboratory, Woolwich. The result shews that there was no special defect in the relations of the two, that is to say, the windage allowed appears to be ample. The interior diameter of the case is 2·73″; the external diameter of the drift is 2·66″. This gives a windage of ·07″.

The drifts and cases used in the Royal Laboratory had* a windage of 0·06″; even 24-pr. rocket and drift has a windage of only ·075″.

It is evident therefore that the accident cannot be referred to the use of too large a drift.

Friction due to injury to case or drift.

(*b*) *Injury to case or drift.*—It is of course not possible to pronounce with absolute certainty that the case had sustained no injury previous to this pressure being applied, because the case is itself split open and distorted. But I examined more than one case of Mr. Macdonald's stock, and they appeared to be all right; the cases being of steel, ·135″ thick, would not very readily receive an accidental injury which would distort them to the extent necessary to produce friction on the entry of the drift; and the drifts, being of solid cast iron, are scarcely liable to distortion. I think this may be confidently dismissed from the category of probable causes.

* 12-pr. rockets are not now made in the Royal Laboratory.

Oblique thrust due to crooked case or drift.

2. *As regards an oblique thrust due to—*

(*a.*) *Crooked case or drift.*—The observations under (*b*) above, *mutatis mutandis*, apply here, and for similar reasons I am of opinion that this cause need not be seriously entertained.

Oblique thrust due to want of truth in press.

(*b.*) *Want of truth in press.*—Without the assistance of a skilled mechanic it would be impossible to ascertain whether this cause did or did not exist, but seeing that the explosion itself had necessarily produced a violent disturbance and some disfigurement of some of the parts of the press, it would hardly have been possible even for a skilled mechanic to pronounce any confident opinion on the point after the event, and this possible cause of the accident did not appear to me to hold a sufficiently prominent position among the *probable* causes to make it necessary to have the press subjected to a strict mechanical examination. It was easy to observe that the table was crooked, but this taught nothing, for this effect had almost certainly been produced by the explosion. It is, however, important that manufacturers should keep a close watch on the condition of the presser employed by them in work of this description, and the experience of the Royal Laboratory Rocket Department shows that with presses having long standards some departure from strict mechanical truth may occur in the course of working. I am of opinion, therefore, that this cause must remain among those to which the accident may have been due, though there are no special grounds for deeming this to have been among the more probable causes in this instance. A defect of this sort would probably be aggravated by the use (as in this case) of an iron drift not shod (as are those in the Royal Laboratory) with gun metal.

Presence of foreign matter in the case or on the drift.

3. *As regards foreign matter—*

(*a.*) *In the case or on the drift.*—Heaver most solemnly assured me that this particular rocket had been sponged out twice, once by himself and once by Gunn, and that it had been thoroughly greased afterwards. He says that the drifts always stood on the table where no grit is liable to come, and that the day when this accident occurred was not a dusty day, and that there was no special reason for suspecting the presence of grit. Still it is not impossible that there may have been some particles of grit or other foreign matter on the drift and in the case, which when the pressure was applied produced undue friction and ignited the composition. At any rate, the rigid exclusion of grit is a point which a rocket manufacturer cannot too strictly or too compulsorily enforce.

Presence of foreign matter in the composition.

(*b*) *Grit in the composition.*—The composition which was used was some which had been obtained from Messrs. Pigou, Wilks, and Lawrence (Limited) of Dartford. The ingredients of which it was composed have been already stated. Until very recently Mr. Macdonald has obtained his rocket composition from Messrs. Curtis and Harvey. The only rockets pressed with the Pigou and Wilks composition were the five rockets which had been pressed (without accident) on the preceding day. The composition (whether Curtis and Harvey's, or Pigou and Wilks') is brought to the factory in calico bags inside wooden barrels, and deposited in the factory magazine. It is not Mr. Macdonald's practice to cause the composition to be sifted before it is used. It would probably be more in accordance with the spirit of Order in Council No. 2, § 13 (it even admits of doubt whether this section does not actually enjoin it*) if all the composition were carefully sifted before use, and it would at any rate be a prudent precaution to take.

I examined some of this composition, and I submitted a sample of it, in comparison with some of Curtis and Harvey's which I took from the factory magazine, and some of the Royal Laboratory composition obtained in the Arsenal, to Mr. Abel, who has caused it to be carefully examined. The following memorandum states the result of his examination.

Memorandum.

Chemical Department,
23rd September 1878.

From	To
War Department Chemist, Royal Arsenal, Woolwich.	Major Majendie, R.A.

* "Wherever danger may arise from foreign matter being present with the explosive or any ingredient thereof, all ingredients to be made or mixed into explosive shall before being so made or mixed be carefully examined, sifted, or otherwise treated for the purpose of removing therefrom or excluding so far as practicable all such dangerous foreign matter." (Order in Council 2, § 13.)

With reference to samples of rocket composition, the moisture contained in the three samples was found to be as under:—

Royal Laboratory.	*Curtis and Harvey.*	*Pigou and Wilks.*
1·05	1·34	1·03 %

All the samples contained minute quantities of gritty matter, the amount being greatest in that of Pigou and Wilks, but in none of the samples was the quantity larger, or the particles greater in size, than is frequently found to be the case of such composition.

(Signed) F. A. Abel.

It does not therefore appear that there is any good ground for supposing that the composition which was used contained such foreign matter as would account for the accident. Here again the reservation must be made, that it *might* have done so. The fact that the sample examined by Mr. Abel contained no such foreign matter does not conclusively establish that the composition which was being pressed was similarly free, but it at any rate raises a strong presumption in favour of such general freedom, and leaves us without sufficient justification for treating this as the most probable cause. It will be observed that the Pigou and Wilks composition was decidedly drier than that supplied by Messrs. Curtis and Harvey, but it was not appreciably drier than the Royal Laboratory composition, and although it certainly was considerably harsher to the touch than either the Royal Laboratory or the Curtis and Harvey composition, such harshness did not amount to a grittiness which would be liable to give rise to an explosion, and was probably due to the use in the Pigou and Wilks composition of somewhat underburnt charcoal. I shall hereafter, when I come to deal with another possible cause, have occasion to refer again to the question of moisture.

Fracture of case.

4. *As regards the fracture of the case.*—It is not impossible that the accident may have been due to this cause. It is a fact that in the Royal Laboratory, when "lap-welded" cases were employed, numerous fractures took place on pressing the rockets, and although in no instance did this fracture actually give rise to an explosion, it is obvious that each such fracture was attended with very considerable danger. It is easy to conceive that the breaking of the case, the sudden formation of a ragged metal edge, into which composition under pressure immediately finds its way while the pressure continues, may comparatively easily produce explosion, and wherever this liability to fracture exists, there exists one risk the more. At present the Royal Laboratory only use rivetted and brazed cases of "Atlas metal." The cases employed by Mr. Macdonald are steel "drawn" (*i.e.* "lap-welded") tubes, and the contingency of such a case breaking under pressure, especially should the support afforded by the mould be from any cause a little defective, is one which cannot be put out of sight. But it is impossible in this instance to say that the accident did or did not occur from this cause.

Friction due to clogging of composition between drift and case.

(5.) *As regards friction due to the clogging of composition between the drift and case.*—This possible cause is one upon which I must confess I am disposed to look with considerable suspicion. The clogging of the composition between the drift and the case may arise from the "spewing up" (as it is technically called) of the composition when the drift is inserted. If a drift be inserted somewhat hurriedly into a case containing a quantity of loose composition, the quantity of such composition puffed up by the sudden expulsion of the air is much more considerable than a person who has had no experience in rocket pressing could suppose. The amount so puffed up may be augmented in one or two ways. First, if the composition be very dry; second, if it be introduced loose; third, if the arrangements for the gradual escape of air are imperfect. Now it happens that all three of these predisposing causes to an excessive accumulation of composition between the drift and the case were present in this instance. The composition, as has been stated, was very dry as compared with that hitherto used in this factory, and the men using it would therefore easily fall into the error of not taking the extra care necessary in inserting the drift to prevent the mischievous results of such increased dryness; they were working with a material dry and dusty beyond their ordinary experience, and it is therefore easy to understand that they would inadvertently so introduce the drift as to produce much greater accumulations of composition up the side of the case than would occur with the comparatively damp composition ordinarily employed by them.

Again, it is especially noticeable that in the Royal Laboratory the composition is not inserted loose into the case (as at Mr. Macdonald's factory), but is introduced in the form of pellets, which being hard and compact, are not liable, as is loose composition, to become puffed up by the escaping air, although even with pellets there is some

accumulation of dust from this cause. It is also worthy of particular remark, that one of the main reasons for adopting the pellet system in the Royal Laboratory was to avoid the excessive dusting which resulted with loose composition. In this respect, therefore, Mr. Macdonald's system is at a marked disadvantage.

Thirdly, while the Laboratory drifts are provided with a number of shallow longitudinal air channels down the portion of greatest diameter (the gun metal end), so as to favour the gradual escape of the air as the drift descends into the case, the drifts themselves being also of reduced diameter above the gun-metal end, Mr. Macdonald's drifts have no air-holes, and are of the full diameter all the way down.

Everything therefore was specially favourable to accumulations of composition between the drift and the case, the dryness of the composition, its being introduced loose, and the absence of air escapes in the drift, together with the drift being of uniform thickness, and, given such accumulations amounting to a clogging of the drift, together with an almost irresistible hydraulic pressure, and it appears to me by no means impossible or improbable to arrive at a resulting explosion. It will be remarked that this accident happened when the maximum pressure was almost obtained, and this is precisely the moment when, assuming the accident to have been caused in the manner now suggested, the explosion would have been most likely to occur. The obstruction would become harder and harder as the drift descended, and the pressure increased, and I conceive that a moment might certainly arrive when (favoured, it might be, by the presence of some minute particle of grit which at another time would be of no consequence) the forcible attempt to pass this obstruction would generate sufficient heat to ignite the composition, and so produce an explosion.

It is well to bear in mind that an accident in the pressure of *wet* guncotton took place in some such manner as is here described a few years ago at Waltham Abbey. It is also a fact that in the driving of port-fires (*i.e.*, *paper* cases containing port-fire composition, driven in with a gun-metal tipped drift and wooden mallet), accidents, which it is difficult to refer to any other reasonable cause than accumulations of composition with or without grit, have occurred, and among the instructions in the Royal Laboratory for men engaged on this work is one that they are to insert the drift gently to avoid these accumulations, keep it in motion while driving to prevent it from becoming clogged or fixed, and keep their heads well back to avoid the consequences of any explosion which might occur.

Conclusion as to most probable cause.

The actual cause of the present accident must, I presume, remain for ever obscure, but, reviewing the various possible causes, I am disposed to assign the most prominent position to the cause last named, viz., the establishment of undue friction from the clogging of the composition between the drift and the case, favoured possibly by the presence of some slight foreign or gritty matter.

General considerations and suggestions.

In any case it is evident that the operation of pressing rockets is one which must always be attended with more or less of risk. As I have shown, there are several *possible* causes of accident, and it should be the duty of the manufacturer to reduce the probabilities of an accident from any of these causes to a minimum.

I do not consider that Mr. Macdonald's method of working effects this. Even assuming that his press and tools are at all times in thoroughly efficient working order, the tools themselves do not appear to be of the construction best adapted to the purpose, the composition is not sifted or examined before use, it is introduced loose, and the cases are of a description which the experience of the Royal Laboratory shows to be liable to fracture in pressing. It would, therefore, be desirable that Mr. Macdonald should, if possible, adopt the system of pressing with pellets instead of with loose composition, that he should model his drifts more nearly on those employed in the Royal Laboratory, furnishing them with gun-metal ends, air channels, and reducing the diameter above the gun-metal ends, and that he should consider the question of substituting rivetted for lap-welded cases. Any precautions which he could adopt to ensure as complete as possible freedom from grit would also be all gain in respect of safety.

And lastly, seeing that with all precautions the operation of forcing what is in fact gunpowder with great pressure into an iron case must always remain a very hazardous one (as is exemplified by an accident which occurred in the Royal Laboratory Rocket Factory, on the 26th July last),* it would certainly be prudent to adopt an arrangement

* This accident, the first that has occurred in the Royal Arsenal since the system of pressing rockets was introduced, occurred during the *withdrawal* of a drift, and when, fortunately, the pressure was on none of the other rockets. No one was hurt; the rockets merely squibbed off, one or two of them propelling their drifts through the roof. The exact cause of the accident has never been accurately ascertained, but there is, I think, little room for doubt that it was due to friction established probably from the presence of some gritty or metallic particles.

by which the men engaged in pumping up the press should be outside the compartment when the pressure is being applied. There would, I believe, be no substantial difficulty in effecting this; and had such arrangement been in force when this accident occurred, its results would have been limited to the injury to the building.

I have the honour to be,
Sir,
Your obedient Servant,
V. D. MAJENDIE,
H.M.'s Chief Inspector of Explosives.

The Right Hon. the Secretary of State,
Home Department.

LONDON:
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Report by the Inspectors of Fisheries on the Provisions of a Bill for the Amendment of the 39th Section of the Salmon Fishery Act, 1873.

Presented to both Houses of Parliament by Command of Her Majesty.

Sir, Home Office, June 10, 1879.

In obedience to the instructions which were given to us by the Secretary of State for the Home Department, we have the honour to inform you that on Saturday, the 7th instant, we held a public inquiry at the Moot Hall, Newcastle, into the necessity for a Bill which has been introduced into Parliament for the better enforcement of a byelaw made under the provisions of the 8th sub-section of the 39th section of the Salmon Fishery Act, 1873.

It may be convenient to describe the circumstances under which the inquiry arose.

The Tyne, the principal river in Northumberland, and the most productive salmon river in England, flows into the sea at Tynemouth. Up to the year 1861 it was fished by nets in the river and by stake nets in the sea. Its fisheries, regulated by a special Act, had been deteriorating for 30 years. The Salmon Fishery Act, 1861, abolished the stake nets at the mouth of the river. A private individual, Mr. Beaumont, soon afterwards threw down a high dam, which obstructed the ascent of salmon up the river. A Board of Conservators, appointed under the Salmon Fishery Act, 1865, took considerable pains to protect the river; and, in consequence of all these measures, the fisheries of the Tyne increased rapidly in value and in importance.

The increase in the importance of the fisheries naturally induced the fishermen to adopt new means for taking the fish. For this purpose they introduced in 1866 hang or drift nets in the sea. These nets, fishing on exactly the same principle as the herring drift net, intercepted the salmon in their passage to the river. The introduction of hang nets was an experiment: it proved a very successful experiment. In consequence, the hang nets increased rapidly in number. A few nets were used in 1866, a greater number of nets in 1867, and a much greater number of nets in 1868.

The nets were used in the sea off the mouth of the River Tyne. On either side of the mouth of the river, the Tyne Navigation Commissioners have constructed two solid masonry piers, each nearly a mile long, thus practically prolonging the river and its mouth for about one mile out to sea. The fishermen soon discovered that the salmon congregated in large numbers behind these piers, and that, while sheltered behind them, they fell easy victims to the hang nets. The Conservators declared that the river was being fished out by the process, and, in consequence, they applied for power to prohibit, and they were empowered by the 8th sub-section of the 39th section of the Salmon Fishery Act, 1873, to prohibit, netting within a certain distance of the piers. In the following year a byelaw was made by them for the purpose, and, since the close of the fishing season of 1874, the use of nets has been illegal within certain well-known limits near the mouth of the River Tyne.

The propriety of this byelaw is not at present in dispute. It may, however, be of some interest, before proceeding to the issues raised at the inquiry itself, to state the results of the byelaw. In the three years which preceded the byelaw, the fishery fell off from 129,100 fish in 1872, to 86,792 fish in 1873, and to 21,746 fish in 1874. In the four years which succeeded the making of the byelaw the produce by the fishery rose to 23,290 fish in 1875; to 24,840 in 1876; to 41,300 fish in 1877; and to 48,150 salmon in 1878.

Having stated these facts in the hope of making the following report both more interesting and more intelligible, we proceed to consider the exact issues which were raised at the inquiry.

The 8th sub-section of the 39th section of the Salmon Fishery Act, 1873, authorises the Conservators "to prohibit the use of nets within a certain

[C.—2337.] *Price* ½*d.*

" distance of the mouth of any river, and of the point of confluence of rivers " in any part of the district (not being a several fishery), and to erect and fix " posts, buoys, and landmarks to indicate such distances respectively."

The Conservators, it is further enacted, may impose a penalty not exceeding the sum of five pounds for each offence against such byelaw.

In accordance with the power which was thus entrusted to them, the Conservators made, and the Secretary of State approved, the following byelaw:—

PROHIBITION OF NETS NEAR MOUTH OF THE RIVER TYNE.

The use of nets is hereby prohibited in all those parts of the sea (in which there is a public or common right of fishery) extending coastwise from a post coloured red on Sharpness Point to a post coloured blue on the Trow Rocks, and bounded seawards as follows:—

First, by an imaginary straight line from the said post coloured red on Sharpness Point to the Trinity Buoy coloured red near the extreme end of the North Pier of the mouth of the River Tyne; then by an imaginary straight line from the said red buoy to the Trinity Buoy coloured black near the extreme end of the South Pier, at the mouth of the River Tyne; then by an imaginary straight line from the said black buoy to the said post coloured blue on the Trow Rocks.

For the purposes of this byelaw the water between the said piers shall be deemed to be sea.

The space in which the use of nets is prohibited by this byelaw is coloured red on the plan annexed hereto.

Any person acting in contravention to this byelaw shall be liable for such offence to a penalty not exceeding five pounds.

The Conservators declare that, so long as they continue unable to attach any other penalty than a fine of five pounds to the infraction of the byelaw, they are practically unable to enforce its provisions.

This difficulty was explained to us, in some detail, by Sergeant Harbottle, a member of the Northumberland Constabulary, who for the last 20 years, under the Chief Constable of the county and the Conservators of the district, has had entire charge of the force employed in protecting the fisheries of the Tyne.

It seems that the difficulty chiefly arises behind, or to the south of, the pier at the south side of the river. The fishermen of South Shields, which is situate in close proximity to this ground, have virtually established a sort of monopoly of fishing on the ground. The fishermen of North Shields, of Cullercoats, and of other places do not usually or intentionally infringe the law. The fact that the law is infringed at South Shields is chiefly due to the temptation which naturally exists to resort to a place where fishing is unusually accessible, easy, and productive. It is perhaps encouraged by the fact that many, or even the majority of the fishermen are not licensees themselves, but men employed or deputed by the license holders to fish for them. In 1878, for example, 39 licenses to fish for salmon were issued to persons living in South Shields: of the persons holding these licenses, 14 were men who had served their time as sailors, 8 were publicans, 4 were pilots, 6 were mechanics, 3 were boarding-house keepers, 2 (holding three licenses) were women, and 1 was a fisherman. It is obvious that many of these licensees—perhaps most of them—could not have worked their own nets. They employed for the purpose of working them all sorts of people. These people, many of them strangers to Shields, some of them foreign sailors who happened to be there at the time, some of them in receipt of parish relief, had not the same interest in the fishery, and perhaps not even the same acquaintance with the law, as the licensees themselves. Without desiring to make any reflection on the licensees, it is reasonable to suppose that they do not pay any particular attention to the precise spot in which the men whom they thus employ fish. So long as these men take salmon, the licensees may imagine that it is not their business to ask where the fish were taken. The licensees can, under no circumstances, be punished for the infraction of the law by these men, and, if they employ men who are either on the point of leaving the neighbourhood or who have not five pounds to lose, the men are not likely to care much for the five pounds' fine.

It follows from this state of things that the byelaw can only be enforced by the almost continuous efforts of the water-bailiffs; and these efforts, continuous and meritorious as they have been, have not proved successful. The best way of enforcing respect to the byelaw would probably be the constant presence of a boat in the place in which fishing is prohibited. But it would be almost impossible to station a boat continually behind each, or even behind one, of the piers. Such an arrangement would require more than the whole force at present at the disposal of the Tyne Board, and would necessitate the neglect of all

the rest of the district. In default of it, the water-bailiffs are compelled either to station themselves on the piers themselves, or to have a boat within the piers in what is known as the Haven, and from time to time to go out to sea in it. A watcher on the piers is practically useless. The men, when they see him, put their coats over their faces, and, disregarding all his orders, go on fishing. A boat within the piers, however constantly it may be at sea, is also useless. The fishermen, since 1876, have themselves stationed a watcher on the South Pier, whose business it is to warn his fellow-fishermen when the water-bailiffs' boat leaves the Haven. It takes the water-bailiffs' boat half an hour to row from the Haven round the piers. This half-hour's law enables all the fishermen to get away. But, if the fishermen have not time to get away themselves, they leave only one of their number in the boat with the net—the other two will swim or wade ashore. The single man, thus left behind, is, of course, the one man whom it is the least easy to punish. Perhaps he is a foreign seaman, leaving the Tyne before the summons can be served on him. Perhaps he is in receipt of relief without five pounds in the world. In some cases, even, when there is a large take of fish, the fishermen refuse to leave off fishing. "It has frequently happened," so Sergeant Harbottle told us, "that "a man has offered me 5*l.* for leave to fish in the 'Playground.'* A man who "has done so is now in court. He said 'What's the use of bothering yourself, "'Harbottle, I will pay the 5*l.*'"

Sergeant Harbottle's evidence was corroborated by some statistics which he gave us. In 1875 there were 57 convictions for fishing in the Playground. In 1876, when the fishermen first stationed watchers on the South Pier, there were 23 convictions; in 1877 there were 30 convictions, and in 1878 there were 37 convictions. Of the 147 convictions which have thus taken place, 26 persons have been convicted twice; 9 three times; 4 four times. It is plain, therefore, that the penalty was no deterrent to the offenders. Many of the offenders detected were in fact never caught; no less than 100 absconded either before or after conviction.

It seems to us that nothing can be worse than the state of things which we have described in the foregoing Report. Either it is right or it is wrong to prohibit fishing in the Playground. If it is wrong to do so, the byelaw which prohibits fishing should immediately be repealed. It it is right to do so, it should at any rate be enforced. A man (whom we may call A) ought not to be at liberty to hire three others (whom we may call B, C, D) to fish for him; to take no precautions against their violating the law; to profit from their violation of it; and to leave them, or one of them, to bear the consequences. The best means of ensuring the better observance of the law in future seems not to increase the punishment of B, C, D, the employees, but to make A, the employer, pecuniarily interested in their conduct.

It seems to us, then, a merit in the Bill, which the Secretary of State has referred to us for inquiry and report, that it makes A pecuniarily interested in the conduct of B, C, D. It directs that the net, which is the property of A, shall be forfeited on the conviction of B, C, D, and consequently, in addition to the penalties which may be inflicted on the latter, deprives the former of an article worth from 10*l.* to 30*l.* (according to its length, make, and age). The course which the Bill takes in this respect is, moreover, consistent with the other sections of the Salmon Fishery Acts. A man who fishes in the annual close season forfeits his net; a man who fishes in the weekly close season forfeits his net; a man who fishes with a fixed engine forfeits his net; and there seems no reason why the man fishing in a place where it is illegal for him to fish should not also forfeit his net. If, moreover, the forfeiture of the net enables the water-bailiff to seize the net when he finds it fishing, it will materially assist the conviction of offenders. It will not, then, be possible, without risk of loss, to leave the net in the custody of a foreigner who may perhaps be on the point of leaving the country, or of an Englishman who may have no lasting connexion with Shields, and who may abscond. The water-bailiff will retain the net, and its owner will thus be punished. But there seems to be a doubt whether the words of the Bill would authorise such seizure. The Bill says:—

"Where any person shall, after the commencement of this Act, be convicted of an offence against any byelaw made under the Salmon Fishery Act, 1873, section thirty-nine, sub-section eight, he

* This name is applied locally to the place in which fishing is prohibited.

M 466. Wt. 3486.

shall, in addition to the penalty imposed by such byelaw, forfeit any salmon in his possession, and any net or moveable instrument used in committing such offence, and the convicting justices shall direct any such net or movable instrument to be sold or destroyed, and the proceeds of such sale shall be paid to the conservators of the district."

It is not quite clear whether, under this language, the bailiff would be justified in seizing the net before the conviction of the offender. The Bill, indeed, in this case, is in the exact language of the section of the Salmon Fishery Act, 1865, which forfeits nets found fishing in the annual close season, and it has been the practice on the Tyne always to seize the nets so found fishing. On one occasion this practice was confirmed by a decision of the County Court Judge, and it is therefore probable that, as the Bill stands, the bailiffs would be able to seize any nets found fishing in the Playground. If, however, it is desirable to have the Bill at all, it may be desirable to make this point clear by substituting the words "where any person shall commit an offence" for the words "where any person shall be convicted of an offence."

Should the Bill, then, pass or not? The opposition to it was conducted by Mr. Stevenson, the Member for South Shields. It proceeded on the assumption that more watchers and not higher penalties were the proper remedy for the illegal fishing, and that it would be very unjust arbitrarily to forfeit a man's property in consequence of the illegal conduct of some other men whose actions he was not present to control. The first of these arguments seems to us to misunderstand the case on the other side. We do not think that higher penalties are so much wanted as penalties applicable to the owners of the nets themselves. The owner may indeed say, as he does in the second argument, that it is unjust that he should suffer for the fault of his servants. If it is unjust, the law is full of such injustice. But there is surely no injustice in making the employer responsible for the illegal actions of the employed: in making the master suffer for the consequence of a breach of the law by his men.

Nor can we avoid mentioning, at this point, that the great majority of the licensees themselves—indeed nearly all of them, except these living at South Shields—are of the same opinion. The management of the Lower Tyne is practically entrusted by the Conservators to a sub-committee. It was at the instance of this committee that the Bill now before Parliament was originated, and the majority of persons attending that committee were fishermen. It seems to us difficult to adduce a clearer proof that the Bill will not, in the opinion of the fishermen themselves, act unjustly, or to adduce a stronger reason for the sanction of Parliament to it.

It may, however, perhaps be thought that the Bill will prove objectionable in some few cases by fettering the discretion of the magistrates. Instances may perhaps occur where a net may be drifted by the tide into the Playground; where the magistrates may have some doubt whether the fisherman has entered it inadvertently or not; and where, though they may feel it their duty to convict, they may hesitate to do so if conviction is necessarily to lead to the loss of the offender's net. We think, therefore, that to meet this possible case an addition might be made to the clause, empowering the justices, in any case where they thought it desirable, to order the return of the net instead of its sale or its destruction, care, however, being taken that the bailiff should not be liable for any pecuniary damage for detaining it in the interval between its seizure and the conviction of the offenders.

All of which we submit for the consideration and approval of Mr. Secretary Cross.

We have the honour to be,
Sir,
Your obedient servants,

FRANK BUCKLAND,
S. WALPOLE,
Inspectors of Fisheries.

The Under-Secretary of State
for the Home Department.

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13

REPORT

OF THE

INSPECTORS OF IRISH FISHERIES

ON THE

SEA AND INLAND FISHERIES OF IRELAND,

FOR

1878.

Presented to both Houses of Parliament by Command of Her Majesty.

DUBLIN:
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REPORT

OF THE

INSPECTORS OF IRISH FISHERIES

ON THE

SEA AND INLAND FISHERIES OF IRELAND, FOR 1878.

TO HIS GRACE JOHN WINSTON, DUKE OF MARLBOROUGH, K.G.,
&c., &c., &c.

LORD LIEUTENANT-GENERAL AND GENERAL GOVERNOR OF IRELAND.

MAY IT PLEASE YOUR GRACE,

We have the honour, in conformity with the 112th sec. of the 5th & 6th Vic., cap. 106, to submit our Report for the year 1878, being the tenth since the Sea and Inland Fisheries of Ireland have been placed under the superintendence of this Department.

SEA FISHERIES.

According to the returns received from the Coast Guard, the number of vessels engaged in fishing for sale in 1878 was 5,759, the number of men so engaged 19,920, and boys 806.

Of the above, 1,525 vessels were solely engaged in fishing, with crews amounting to 6,319, men and boys. The remainder, 4,234 vessels, with 14,407 men and boys, were only partially so engaged.

The foregoing shows an increase of 377 vessels, and 333 men and boys employed in the Sea Fisheries of Ireland, as compared with the returns for 1877.

Although every effort has been made to secure accuracy in the returns of boats and persons engaged in the fisheries, we cannot say that this has yet been attained, but it is believed, that, on the whole, the present return is more correct than those hitherto issued.

It may appear strange that it should be difficult to secure accuracy in such returns, but when it is remembered, that the subordinate officers of Coast Guards in charge of the different stations, who have to prepare these returns, are frequently changed, the great extent of many of their Guards, and the reluctance shown by the fishermen in some parts of the coast to give information, the difficulty will be more easily understood.

The following is an extract from the instructions issued by this Department for the year 1878, for the guidance of officers in performing this duty :—

"1. Every boat engaged in sea fishing where any portion of the fish is sold should be included in this Return, *whether Registered or Unregistered.*

"2. No vessel or boat should be returned as a fishing craft unless some portion of the fish taken is sold.

"3. Return only as fishermen persons employed in sea fishing boats that capture for purpose of sale.

"4. As fishermen frequently fish in different boats, according to the season, care should be taken that the names of such men are shown only in one place.

"5. Every effort should be made to enforce the Registry of all Boats used for Fishing, when any part of the fish is sold.—Boats engaged only in Salmon Fishing need not be so registered.

"As many fishermen entertain groundless objections to registering, it should be explained to them that they incur no liability or expense by registration, and are liable to a penalty for neglecting it."

Notwithstanding these instructions, which it is considered should be sufficient to ensure correctness and uniformity, it is found that some of the Officers take different views of what is required; hence the great difficulty above referred to.

We feel bound again to bring under Your Grace's notice the fact that the usefulness of this Department would be very largely increased, if we had attached to it a properly equipped vessel, which would enable us, not only to visit islands situated off the coast, but, to carry out experiments in different modes of fishing, and for the discovery of new fishing grounds.

It has often been alleged that, off the west coast, very large and productive banks, which abound with valuable fish, are to be found, and it is believed that different kinds of fish, which are not generally looked for, and but little known in this country, frequent parts of our coasts.

Such matters as these require to be thoroughly investigated, and we respectfully submit that the advantages, which it is believed would result to the country from such investigations, would far outweigh the cost of providing this Department with the means of making them.

As usual, the conduct of the fishermen around the coast is reported as very satisfactory.

Galway Bay.

The removal of the restrictions against trawling in certain parts of Galway Bay, by our Bye-law, dated 31st August, 1877, and which was confirmed and came into force on the 11th February, 1878, has been found beneficial in securing a large capture of fish by the trawlers, whilst at the same time the line fishermen have also had a very successful season.

It was anticipated by many persons that the removal of the restrictions might lead to considerable opposition and resistance on the part of some of the parties interested; but, happily, up to the present no serious unpleasantness has resulted.

Some complaints have been received of the trawlers having damaged and carried away portions of the lines of some of the local fishermen. These reports have been rather exaggerated, but it is hoped that by the exercise of greater caution on the part of the trawlers, no future grounds of complaint will arise.

Trawling on the East Coast.

In our last Annual Report mention was made of our intention to hold inquiries to ascertain whether or not it would be desirable to make some change in the regulations respecting trawling along portions of the east coast.

Up to the present, the pressure of our other duties has prevented our being able to hold these inquiries, but we trust in a short time to have the subject investigated, especially as representations have been made to us in the interest of some of the trawl fishermen.

Oyster Fisheries.

Nothing especially deserving attention has occured in respect of the oyster fisheries.

There was a fair fall of spat in some localities, but it was by no means general.

Seven new licences to plant oysters have been granted, and four withdrawn.

The Arklow fishery produced 7,325 barrels. During the year the price realized averaged £1 per barrel.

The French oysters, laid down in the private beds, have in some cases, thriven well, but it cannot be said that they have proved quite successful, generally. Most of these were imported from Arcachon.

In his Report on the Oyster Fisheries of France, dated 28th February, 1878, Major Hayes, at pages 22 and 23, remarks that along the French coast he found "in proceeding south the invariable opinion at the different places to be much in favour of the "oysters imported from the district of Auray; they were said to be hardier, that they "thrive better, and that the loss in transport is less than those from Arcachon."

In only one place in Ireland have oysters been imported from Auray, viz., at Omeath, Carlingford Lough, by C. O. Woodhouse, esq., and his experience fully bears out the opinions of the French cultivators. It is understood that the loss in those imported by him has not amounted to three per cent.; they have thriven well; and have become since they were laid down more like the native Irish oyster than any brought from the Arcachon district.

We are strongly of opinion that it would be to the advantage of oyster culturists generally, to import from the Auray or Vannes districts instead of Arcachon. It should be remembered that the two former places are somewhere about 150 or 160 miles further north than the latter; the temperature consequently is not nearly so high, and thus does not differ in so great a degree from our own climate.

Hitherto, difficulties in obtaining direct transit from Auray or Vannes to Ireland have been greater than from Arcachon, but these can be surmounted; and it is understood that through rates may be obtained to Dublin or Greenore by communicating with the authorities of the London and North Western Railway Company.

The Herring Fisheries.

The quantity of Herrings captured at nine places from which we are enabled to procure reliable statistics amounted to 169,603 mease. The average price per mease at which they were sold was £1 2*s.* 9*d.*, producing in the aggregate a sum of £220,278 as compared with 284,424 mease, averaging £1 5*s.* 9*d.* per mease, taken in 1877.

Very large quantities are taken along the western coast, but it is impossible to obtain reliable returns of the capture.

Herring Fishery, 1878.

——	Boats employed, and highest number on any one day.				Total Capture.	Average Price.			Value.
	English.	Scotch.	Irish.	Manx.					
					Mease.	£	*s.*	*d.*	£
Howth, between 24th May and 7th Dec., 1878,	210	215	350	210	68,060	1	3	8	80,694
Arklow, between 9th June and 15th Dec., 1878,	–	–	91	–	6,359	0	16	8	5,285
Kinsale, between 29th April and 21st Dec., 1878,	–	20	22	8	1,372	1	17	5	2,569
Greenore, between 4th June and 27th Nov., 1878,	–	5	45	11	46,754	1	3	8	55,155
Ardglass, between 25th May and 7th Dec., 1878,	40	152	79	37	58,335	1	1	10	63,830
Omeath and Warrenpoint, between 4th June and 19th Oct., 1878,	–	15	50	105	455	1	4	0	546
Kilkeel, between 1st June and 1st Nov., 1878,	200	43	75	–	1,300	1	5	0	1,625
Annalong,	–	–	35	–	9,000	1	0	0	9,000
Courtown,	–	–	35	–	1,968	0	16	0	1,574
					193,603	1	2	9	220,278

It will be seen that the number of Irish boats employed in the herring fishery has largely increased since 1877.

It may be well to refer to a mistaken idea which prevails largely in this country on the subject of the herring fishery, with regard to the alleged disadvantages the Irish fishery labours under in not having an established government brand for cured herrings, as in Scotland.

In the year 1876 we received instructions from the Chief Secretary to inquire into and report for the information of his Grace the Lord Lieutenant our opinion upon the advisability of extending to Ireland the Scotch system of branding herrings, and also whether any practical benefit would really be derived from such extension, having regard to the circumstances of the Irish herring fishery trade.

It should be borne in mind, that, at the great centres of the herring fishery in Ireland, the fish are sold by auction directly after being caught, and are paid for on the spot; and the great bulk is immediately dispatched to England by special steamers employed for the purpose.

The following is an extract from the unanimous report made by our Board, dated January, 1877 :—

"One of our Board (Mr. Brady), proceeded to Scotland and investigated the details connected with the Scotch herring fisheries, and the branding system pursued in certain places there. A copy of his report is annexed." (Copy sent with report).

"Inquiries were also held at the principal herring fishery stations in Ireland by Mr. Blake and Major Hayes, and we investigated the subject from time to time at other places, as opportunity offered.

"After a very careful consideration of the question on every point, we have to report that we are unable to recommend that the branding system should be extended to this country, and in this we are mainly influenced by the following reasons :—

"1st. Although it has from time to time been argued that the introduction of the brand would lead to a further development of the herring fisheries in Ireland, we have been unable to find that any *bona fide* desire for it exists amongst the Irish fishermen or curers.

"2nd. It appears that in Scotland, where the fish are cured for the foreign markets, the price received by the fishermen is about 22*s.* per cran of 960 herrings; whereas in Ireland, sold by auction immediately after being caught, they have realized much higher prices to the captors, as will be seen by the following average prices of the last four years. The Irish herrings realized—

"In 1873—£1 5*s.* per mease of 630—equal to about £1 10*s.* 9*d.* per cran.
"1874—Irish herrings sold at 18*s.* 9*d.* per mease—equal to £1 7*s.* 4½*d.* per cran.
"1875—Irish herrings sold at £1 1*s.* 9*d.* per mease—equal to about £1 12*s.* 7½*d.* per cran.
"1876—Irish herrings sold at £1 6*s.* per mease—equal to £1 19*s.* per cran.

"These figures show that under present circumstances the Irish fishermen realize much higher prices than those obtained in Scotland.

"3rd. Any herrings cured at present in Ireland, as a matter of fact, sell at higher prices than can be obtained for the highest brand of Scotch herrings. Therefore, in our opinion, the extension to Ireland of the Scotch branding system would not be advisable, and we consider that no material benefit would really be derived from such extension, having regard to the circumstances of the Irish fishery trade."

The Mackerel Fishery.

The Kinsale fishery for 1878 was not so satisfactory as the season 1877, the gross capture, as taken from the returns, amounting only to 92,626 boxes of six score each, as compared with 114,562 boxes in the previous year.

The prices realized varied from 90*s.*, the highest, to 5*s.*, the lowest, per box, producing in the aggregate a sum of £97,788 8*s.* 6*d.*, being an average of a little over 21*s.* per box.

It is believed that the season would have been a very successful one but for the destructive gale which set in on the 26th March, and which resulted in placing about half the fleet *hors de combat.*

Large numbers of boats lost their entire trains of nets, and on the 3rd April it was estimated that not more than one-third of the fleet was able to fish—many boats with only half trains. Seventy or eighty boats had to return home to procure new trains, whilst many others were engaged in repairing and clearing what little they had left.

It is but seldom that any loss of life occurs amongst the fleet attending the mackerel fishery, but on the present occasion we regret to say that eleven men were lost—viz., 7 men, the entire crew of the *Somerset*, No. 49, of Peel, which foundered with all hands; two men of the *Mary Lily*, of Port St. Mary, and two men from the *Dolly Varden*, of Arklow; altogether, eleven men.

One boat owner is believed to have lost over £2,000 in consequence of the gale, and the total loss is estimated at between twenty-five and thirty thousand pounds.

A great part of the month of April was thus lost to a large portion of the fleet, which fully accounts for the diminished capture.

In last year's Report we referred to the great desirability of the port of Kinsale being provided with the usual storm signals, and in February, 1877, we made a representation on the subject to the authorities. After a lengthened correspondence with various departments, the Meteorological Department of the Board of Trade consented to grant the use of the storm signals, and to cause notices of any serious atmospheric disturbance to be forwarded from time to time.

The Admiralty also having consented to the signals being placed in charge of the chief officer of Coast Guard at Summer Cove, Kinsale, and the Harbour Commissioners having provided certain necessary gear in the way of ropes and blocks, the signals were duly established since June last.

We trust that in the coming season, and for the future, this will be a means of guarding against a repetition of the serious catastrophes of 1876–7.

During the season there were 265 English and Manx boats, 20 Scotch, and 190 Irish attending the mackerel fishery, being a further increase of Irish boats since last year of 18, and since 1871 of 90, thus showing year by year that more interest is being exhibited in Ireland in developing this important fishery.

During the season nine vessels arrived from Norway laden with ice, their gross tonnage amounting to 5,707 tons. The ice was stored at Kinsale in twenty-one vessels used as hulks, their tonnage amounting to 2,103 tons.

Eight steamers and four Jersey cutters were constantly employed, besides occasional tug-boats from Queenstown, conveying the fish to England.

In addition to our own fleet, there were 107 French luggers employed at the fishery, and it is believed many of them filled up two or three times, returning each time to the fishing ground after taking their cargoes to France.

Complaints were made of some of the French crews interfering with the nets of our boats; but, as far as could be ascertained, after due inquiry, the complaints were unfounded.

A certain amount of jealousy prevails against foreigners coming on the fishing ground, more especially amongst the Manx fishermen; and we fear this will always continue: but as a rule the foreign boats fish far out to sea, to the westward, and generally keep clear of our boats.

It might be worth the attention of parties engaged in the mackerel fishing, to consider whether in some things they might not with advantage take a lesson from the Frenchmen. The French boats are larger than ours, their nets much longer, and many of them have on board a small engine with which to haul their nets and to raise their

masts. In a few cases they are provided with a small screw propeller, which can be connected with the engine, when required, to move to or from the fishing ground in adverse winds or calms, thus saving much time—a matter of importance, in a season, which only lasts about three months.

Mackerel in considerable quantities are captured off many other parts of the coasts; but, as conveyance to the English markets is difficult, they are generally consumed locally.

During March and April the prices for mackerel ranged high, but at the end of April and during May they fell considerably. A few boats then took out their herring nets, and were fairly successful, the average take per boat, per week, being about £27. In some cases they were more fortunate, their capture amounting in the week to as much as £55 per boat. The herring fishing was done principally by Scotch and Irish boats.

The Pilchard Fishery.

Pilchards in considerable shoals appeared as usual off many parts of the coasts of Cork and Kerry, especially the former; and if proper arrangements were made for their capture and to cure them for foreign markets, it is believed the enterprise would prove remunerative.

As alluded to in our last Report, a small company was formed at Baltimore, county Cork, with the object of taking and curing these fish. It is understood that they succeeded in curing between three and four hundred hogsheads, the greater part of these having been purchased from the local fishermen. From some cause which has not been explained to us, the nets of the company were not as successful as they might have been, their capture not much exceeding one-fourth of what was cured.

We entertain little doubt that fisheries of this kind properly worked, with the necessary appliances for curing, would pay satisfactorily in some parts of the coast.

Piers and Harbours.

The following, which has been received from the Commissioners of Public Works, will show what progress has been made since our Report of last year:—

1. Giles'-quay, county Louth,	Completed and handed over to county. Total expenditure in the construction, £9,358 12*s.* 6*d.*
2. Poul-Hurrin, Gortalia, county Donegal,	Engineer's examination not yet made.
3. Malinbeg, county Donegal,	Do. do.
4. Port-Oriel, Clogher Head,	Completed. Additional works if undertaken can be completed this season.
5. Tawney, county Donegal,	Engineer's examination not yet made.
6. Muckross, county Donegal,	Do. do.
7. Ballysaggart, county Donegal,	Do. do.
8. Scattery Island, county Clare,	Engineer's estimate £700. Communicated to memorialists—no reply.
9. Bournapeaka, Ballyvaughan, county Clare,	Will be completed early this year.
10. Smeerogue or Poolally, county Galway,	Engineer's examination not yet made.
11. Molranny, county Mayo,	Engineer's estimate sent to memorialists. Awaits presentment and contribution.
12. Scilly, Kinsale, county Cork,	Inquiry as to the best site pending.
13. Burton Port, county Donegal,	Engineer's estimate sent to memorialists, who propose a smaller sum.
14. North Harbour, or Kearn's Port, Cape Clear, county Cork,	In progress. Will be completed within next year.
15. Ardglass, county Down,	In progress. Contractor to complete work by 1st December, 1880.
16. Cheekpoint, county Waterford,	Not yet reported on by Engineer.

It is to be regretted that the decision of the Treasury not to grant Loans in aid of Fishery Piers, until the Harbours of Ardglass and Arklow have been completed, remains still in force. The advantage to the country generally of providing safe and convenient shelter for fishing boats would in our opinion be of such importance in developing the fisheries around our coasts as ought to secure that every encouragement should be given to provide them wherever required.

The important work now being carried on at Ardglass Harbour, which we have recently inspected, we have little doubt will, when completed, give a great impetus to the east coast herring fishery, not only by tending to increase the number of fishing vessels but by enabling the fishermen to continue their fishing to a later period in each season than hitherto.

The want of shelter in the harbour, in consequence of the partial destruction of the old pier, rendered it so unsafe in certain winds, which prevail late in the season,

that the herring fleet have generally to take their departure at an earlier period than they would otherwise have done.

It is hoped that in carrying out this most important work the existence of a very dangerous ledge of rocks almost in the centre of the harbour has not been overlooked. The ledge alluded to, called the "Churn Rock," has long been regarded with dread by the fishermen, and several wrecks have occurred upon it—its removal, during the progress of the present work, could be easily accomplished, and would largely increase the harbour accommodation, which is much needed; unless this is done the harbour will always be insufficient for the requirements of the herring fishing fleet.

Reproductive Loan Fund.

Reports will be found from the inspectors, with regard to the administration of this fund in their respective divisions.

The amount available for 1878 was £6,741. The sum applied for, £11,302 14*s.*, embracing 557 applications and comprising 945 persons.

300 loans comprising 457 persons for £5,588 10*s.* were recommended. 21 loans were cancelled or not perfected for £308, so that £5,187 10*s.* was actually issued on 279 loans up to date of this Report.

In the county Limerick £625 available, but only one application was received.

In county Sligo £267 was issued out of £449 available, and in the county Kerry £2,304 was taken up out of £2,450 available. As will be seen in the Appendix, with the exception of the counties of Leitrim and Limerick, the amount applied for far exceeded the amount available.

In the four years since the passing of the Irish Reproductive Loan Fund Act, up to 31st December, 1878, 1,078 loans for a total sum of £19,352 have been made, and up to that date repayments have been received amounting to £10,776 3*s.* 6*d.*

The amount overdue up to the present time is £228 14*s.* 4*d.*—much of this will be recovered—so that the losses by defaulters will, as far as we can at present form an estimate, be more than provided for by the rate of interest (2½ per cent.) charged, and thus the original fund will be preserved intact.

Considering the bad harvest of 1878, and the bad fishing season in many parts of the country, we cannot but consider that the results, up to the present, are most satisfactory.

STATE OF THE SEA FISHERIES.

Dublin Division.

From Howth to Greystones, both Stations inclusive.

According to the Coast Guard Returns there are in this division 193 fishing craft, with 723 men and 104 boys employed in same, as compared with 199 vessels and boats, with 555 men and 64 boys, in 1877.

Trawling, long and hand lines, and draft nets are the means of capture.

Large shoals of mackerel appeared off Greystones in August and September, for which adequate means of capture existed. Herrings, cod, plaice, soles, turbot, whiting, and other fish are caught.

The only lobster and crab fishing in this district is at Bray Head, and between Dalkey and Bullock. About 3 dozen lobsters and 5 dozen crabs a week during the season were taken here, but the size was small.

The conduct of the fishermen throughout the district was good.

No part of the division is unguarded.

Oyster Fisheries.

From the oyster beds of Clontarf about £280 worth of oysters were sold during the year. The Sutton oyster beds, from stock laid down in 1877, at a cost of £2,007, sent to the market 248,000 large oysters and 245,000 small ones, realizing altogether £2,852 1*s.* 6*d.*

Arklow Division.

From the Breaches, County Wicklow, North, to the Sluices, near Cahore, County Wexford, South, a length of 56½ miles.

No portion of this division unguarded.

The Coastguard Returns show as employed in the fisheries during 1878, 345 vessels, 1,347 men, and 67 boys, which, as compared with our report of last year, would give an apparent increase of 3 vessels, but a decrease of 284 men and an increase of 58 boys.

Of the boats, 9 were of the first class, 281 second, and 55 of the third.

The fish principally taken are herrings, cod, oysters, and trawl fish. Mode of fishing, nets, lines, dredges, and trawls.

There were 7,325 barrels of oysters taken from the banks. Average price per barrel 20*s.*, realizing £7,325.

From one ground it is reported that the spatting was much the same as in 1877. In the Arklow ground the report is unfavourable.

Shoals of mackerel appeared about a quarter of a mile from the shore in September between Ardmore and Mizen Head, a little south of Wicklow.

It is understood that although nothing definite has, we believe, been decided upon about the projected improvements to Arklow Harbour, yet, that negociations are going on on the subject, and in the interests of the fisheries it is to be hoped that some decision may be speedily arrived at.

The conduct of the fishermen was good.

Wexford Division.

From the Sluices near Cahore to Bannow Bay.

The Harbour of Wexford, from Rosslare to Raven Point, is unguarded, being under the control of the Customs Authorities.

In this division there are 166 boats, 612 men, and 5 boys engaged in sea-fishing. Of these 14 are first class boats, 133 second, and 19 third.

Solely engaged in fishing, 60 boats, 147 men, and 4 boys; partially, 106 boats, 465 men, and 1 boy. Fish generally captured--Herrings, mackerel, cod, bream, conger, pollock, &c.

The modes of fishing are drift and trawl nets, hand and long lines.

Shoals of mackerel and herrings appeared off the coast between August and November.

Lobsters and crabs of fine quality were captured in great numbers around the Saltee Islands, and generally between this and the entrance of Wexford Harbour considerable numbers were taken.

The fishermen are reported as well behaved. Nothing especially deserving note has occurred during the year.

Waterford Division.

From East Bank of Bannow Ferry to Ballyvoile Head, north of Dungarvan Harbour.

This division extends along the coast for a distance of 62½ miles, all of which is guarded; but in the estuaries the following portions are unguarded :—

From Oyster Point to Wellington Bridge, 5 miles; from Ballyhack to Fisherstown, 8 miles; from Glass House to Rochestown, 7 miles; from Churchpoint to Blackrock, 10 miles; total 30 miles.

In the division there are 137 boats, 356 men, and 18 boys employed in the sea fisheries—13 first class boats, 100 second class, and 24 third class.

Of the above there are solely engaged in fishing, 20 boats, 49 men, 11 boys; partially so engaged, 117 boats, 307 men, 7 boys.

The fish principally taken are plaice, soles, turbot, brill, bream, cod, hake, ling, mackerel, whiting, and sprats, and occasionally herrings in large quantities.

The modes of fishing are trawling, seines, long-lines, hand-lines, &c.

There has been an unusually good supply of mackerel and sprats, and they are reported to have remained later than usual off the west end of the division.

The supply of lobsters and crabs is stated to have been good.

Oysters are said to be decreasing.

It is reported that off Bonmahon more mackerel, bream, cod, whiting, and mackerel were seen, but the take was not large owing to the want of proper gear for their capture.

The fishermen are reported to have been orderly and well conducted.

Youghal Division.

From Ballyvoile Head, near Dungarvan, to Ballycottin; a distance of 56¼ miles.

Unguarded :--From Tullacort Point to Ballyvoile Bridge, two miles; from Mine Head, East, to Corrin River, West, six and three-quarter miles; from Goat Island to Ferry Point, five miles; from Glanwilliam to Ballycrivane, five miles; total, 18¾ miles.

The Coast Guard returns show as engaged in the sea fisheries 128 boats, 610 men, 6 boys, viz. :—9 first-class boats, 79 second-class, and 40 third-class. Of these 33 boats, 217 men, and 5 boys are shown as solely engaged in fishing, and 95 boats, 393 men, and 1 boy only partially so engaged.

Hake, cod, ling, plaice, soles, mackerel, bream, whiting, and large quantities of sprats were captured.

Large shoals of mackerel, pilchards, and sprats in July, August, and September.

Inadequate means for the capture of mackerel.

Large quantities of lobsters and crabs were taken in the season.

The fishermen reported as very orderly.

Queenstown Division.

From Garryroe, in Ballycottin Bay, West, to Lane's Cottages, Ringabella Point, East. Length of coast, 110 miles.

Unguarded portion of division :—All the estuary of Cork Harbour, from and including Queenstown to the City of Cork.

The returns show that 209 boats, 564 men, and 55 boys were engaged in the sea-fisheries in 1878, viz. :—7 first-class boats, 110 second-class, and 92 third-class. Of these 98 boats, 303 men, 29 boys were solely engaged in fishing, and 111 boats, 261 men, and 26 boys only partially so engaged.

Fish generally captured—Turbot, sole, plaice, conger, mackerel, hake, cod, pollock, whiting, bream, gurnard, sprats, and oysters.

The fishing is by means of trawls, long lines, hand lines, and seines.

Mackerel appeared in quantities in August and September, close to the shore, off Ringabella. Not adequate means of capture.

Lobsters and crabs were taken, but not in any great quantity.

The fishermen are reported orderly. Nothing of any importance has occurred since report for 1877.

Kinsale Division.

From Myrtleville Point, East, to Galley Head, West ; a distance of 110 miles.

Unguarded portions :—From Barry's Head to Flat Head (Oyster Haven) $1\frac{3}{4}$ miles ; from Muckross to Virgin Mary Point, Dunny Cove, 3 miles 180 yards ; total 4 miles, 1,500 yards.

In 1878 there were 342 boats, 1,632 men, and 107 boys reported to have been engaged in the sea fisheries, viz. :—60 first-class boats, 111 second-class, and 171 third-class. Of these 84 boats, 487 men, and 47 boys were solely engaged in fishing, and 258 boats, 1,145 men, and 60 boys as only partially engaged.

The fish found in the greatest quantities off this division are mackerel, herring, sprats, pilchards, bream, pollock, cod, hake, soles, whitings, and scad, and a few oysters.

Large shoals of pilchards, mackerel, scad, and herrings were seen off the coast from June to September, but the principal mackerel fishery is from March to June.

Lobsters and crabs were taken in fair quantities, and the supply is said to be increasing.

In last report mention was made that application had been made with the view of having the Storm Drum Signals established at Kinsale—this has been accomplished, and is in working order at Summer Cove, Kinsale.

Fishermen throughout the division are reported to have been well behaved.

Skibbereen Division.

From Galley Head to Snave Bridge—about 170 miles.

Unguarded about 70 miles, viz., Three Castles Head to Carberry Island, Carberry Island to Snave Bridge ; from Rinks Castle to Ballydehob, besides the Islands of Clear, Sheskin, Ringarogy, Long, Castle, Horse, and other smaller ones, occasionally visited.

The returns from Coastguard show that in 1878 there were 272 boats, 1,226 men, and 29 boys employed in the sea fisheries ; of these 77 boats, 322 men, and 10 boys, have been solely engaged in fishing ; and 195 boats, 904 men, and 19 boys, partially engaged.

Fish generally taken are cod, ling, mackerel, hake, pollock, bream, pilchards, and scad.

Modes of fishing—seines, hand and long lines, trawls, drift nets, and trammels.

Pilchards, in July, August, and September, appeared off the coast in large shoals, and a considerable number were captured.

Shoals, also, of mackerel and herrings were seen at various times from May to July.

Considerable quantities of lobsters have been taken in this division, and the capture of lobsters and crabs is reported to have been very large.

The fishermen reported to have been well behaved throughout this division.

Castletown Division.

From Kenmare Bridge to Snave Bridge, Bantry Bay.

A considerable portion of the coast in this Division is unguarded, viz. :—From Carriglass to Snave Bridge, 16 miles; Clanderry Head to Kenmare, 14 miles; Cod's Head to Ardelaggan Point, 4 miles; Garrinish Bay to Dursey, 6 miles; Dursey Head to Pulleen 7 miles.

The returns show that in 1878 there were 133 boats, 689 men, and 10 boys, engaged in the sea fisheries, viz., solely engaged in fishing, 6 boats and 23 men; only partially engaged, 127 boats, 666 men, and 10 boys.

The fish in general frequenting the coast are mackerel, pilchards, herrings, cod, ling, hake, pollock, whiting, &c.

Modes of capture—seines, herring nets, long lines, and hand lines.

The fishing during the year has not been as good as during the year 1877, but off the Dursey Island it is reported that large quantities of mackerel were taken late in the season.

Herrings and pilchards were seen in large shoals off the Allihies ground, but the fishermen were not provided with proper means for their capture.

A few lobsters were taken.

The fishermen are reported to have been quiet and orderly.

Killarney Division.

From Kenmare Bridge, south, to Blennerville Bridge, near Tralee, north.

Length of coast line, 281 miles. Unguarded 56 miles, viz. :—Inch to Castlemaine, 14 miles; Slea Head to Cloger Head and the Blaskets, 8 miles; Brandon Creek to Blennerville and Maharees, 34 miles. Total, 56 miles.

By the Coastguard returns there were 314 boats, 1,395 men and 9 boys, engaged in the sea fisheries, viz. :—Solely engaged in fishing 133 boats and 478 men; partially engaged, 181 boats, 917 men, and 9 boys.

The kinds of fish generally captured is—turbot, soles, bream, brit, plaice, cod, ling, hake, pollock, shad, mackerel, pilchards, &c.

Fish it is reported were generally scarce throughout the district during 1878.

Large shoals of mackerel and pilchards were seen off Ballydavid Guard. Quantities of herrings, mackerel, and pilchards were seen, and the captures were considerable.

A considerable quantity of lobsters were taken during the year.

The fishermen are reported as orderly and well behaved.

Ballyheigue Division.

From Blennerville, County Kerry, to Foynes, County Limerick.

Extent of division, seventy-five miles, of which there are forty-nine unguarded.

There are 88 boats registered, viz., 1 first-class, 34 second, and 53 third-class; and crews of 257 men and 3 boys. Of these boats there are solely engaged in fishing 9 second and 9 third-class, and only partially engaged, 1 first, 25 second, and 53 third-class. This return shows an increase of 5 boats during the year. Very little fishing is carried on in this division; the chief place where fish are caught is in Tralee Bay. The people are generally small farmers, and only follow fishing occasionally. The modes of fishing are long lines and drift nets for herrings. A large shoal of the latter and mackerel appeared on the Kerry shore of the Shannon in September, and a good many were captured; but owing to the weather becoming very bad the fishing could not be continued and the fish disappeared. No mackerel were taken, as there are no mackerel nets in this locality. Large shoals appeared from five to seven miles off Tralee Bay in August, and many were captured.

A few lobsters were caught off Kerry Head. The fishermen are generally orderly and peaceable.

Oyster Fisheries.

There are large public banks in Tralee Bay and in the Shannon at Tarbert, Ballydonohoe, Ballylongford, Kiltiery, Longrock, and Carrigeens. They are not improving, and so far as can be ascertained, very little spatting during the past season. Bye-laws are in force, prohibiting the taking of small oysters, but from other onerous duties the Coast Guard find it very difficult to enforce them, and there is no other authority to do so. They frequently overhaul the boats dredging. Some of the private oyster beds in this division are doing well, and the oysters bring a very high price in the market. A large quantity has been imported from France, and the experiment is reported to be successful. The oysters from one private bank bring as much as 15*s.* a hundred, delivered at the railway station in Tralee, so good is the quality considered.

SEAFIELD DIVISION, COUNTY CLARE.

From Ballycrinon to Cancapple Head.

Extent of division, about 149 miles, of which about 67 are unguarded.

There are registered in this division 155 boats, with crews amounting to 411 men and 4 boys. Of these there are only 14 boats (third-class) and 42 men solely engaged in fishing; and partially engaged, 1 second and 140 third-class boats, with crews amounting to 369 men and 4 boys. This shows an increase of boats registered in the division of 11 boats and 41 men.

Cappa Station.—Ballymacrinon to Querrin. The only fish captured are herrings, and only in small quantities, which are captured by drift nets; no trawling carried on. A small quantity of oysters is taken from Moyne to Querrin, a distance of about six miles, during the season, under £100 worth. The beds are not improving. Unguarded portion of coast at this station about three miles.

Kilcredane Station.—Querrin to Bealnaglass. The fish generally captured are herrings, mackerel, and ling, lobsters and crabs. Large shoals of herrings appeared in July, August, and September, but few were captured. Large shoals of mackerel also appeared to the N.E. of Loop Head in October, but owing to bad weather the canoes could not venture out more than two or three nights, although the people had their mackerel nets ready. The fishermen in this locality suffer particularly from want of a little improvement being made at a place called Goleen, which could be made, at a small expense, a safe place of shelter for the canoes, many of which frequent the harbour. If this were carred out it would be a great incentive to the fishermen, and a large quantity of mackerel, which is now lost, might be taken in the season. Unguarded portion about thirty-seven miles.

Kilkee Station.—Bealnaglass to Doonbeg, about 16 miles.

Cod, ling, and mackerel are the principal fish captured. Large shoals of mackerel appeared close to the shore from August to October. With few exceptions the fishermen are well supplied with means for their capture. Large quantities of very fine lobsters and crabs were captured this year at Kilkee and Farrihy; it is impossible to ascertain, even approximately, the quantity. Unguarded—about thirteen miles.

Seafield Station.—From Doonbeg to Spanish Point.

Bream, ling, mackerel, and lobsters are the descriptions of fish generally captured. Large shoals of mackerel appeared in September and October, about two and a half miles from shore. The people have adequate means for their capture; the weather, however, was against them. Large quantities of lobsters and crabs were captured north and south of Mutton Island. Unguarded—about three miles.

Liscannor Station.—From Spanish Point to Cancapple.

Bream, cod, and ling, are the principal descriptions of fish captured; canoes only employed. Lobsters and crabs were taken in a small quantity this year. They abound on the coast, but the difficulty of getting them to market is the great drawback to any improvement. No steps have been as yet taken to remove the rock which is so dangerous at the mouth of the Liscannor Harbour. Unguarded—about twelve miles.

The fishermen in the whole division are reported to be peaceable and orderly.

Oyster Fisheries.

The principal public banks are in Clonderlaw Bay, and they are not improving. Great difficulty exists in enforcing the bye-laws preventing the capture of small oysters, the Coast Guard stations being so far away from the beds, and there being no other authority to do so.

Galway Division.

Canamallagh Point, county Clare, to Mace Head, county Galway.

There are registered in this division 444 vessels and boats, with crews of 1,103 men and 34 boys. They embrace of first-class, 10 vessels and 40 men and 10 boys; of second-class, 6 boats and 24 men; and of third-class, 54 boats and 130 men, all being solely engaged in fishing; while there are only partially so engaged of second-class, 182 boats, with 571 men and 10 boys; and of third-class, 191 boats and 338 men and 14 boys. Both the quantity and quality of fish in Galway Bay has improved, as is evidenced by the addition of three trawlers to the fleet, and the well-stocked state of the fish market during the season.

Ballyvaughan Station, guarded.—Black Head to Muckinish Castle, about 10 miles, unguarded from Canamallagh Point to Black Head, and from Muckinish to Claren Bridge, a distance of about 60 miles. The principal descriptions of fish captured are cod, ling, bream, whiting, mackerel, and herrings. The trawling vessels belonging to Galway work also along this shore and round Black Head, and get the finest descriptions of flat-fish. In November and December they get large quantities of very fine plaice inside Glenina. Large shoals of mackerel in July, August, and September, off this coast, but no means of capture except hand lines, and few consequently taken. A slight show of pilchards also, but hardly any herrings made their appearance this year. The capture of round fish by the long lines was better than for many years past. There are 7 boats fishing for lobsters at Glenina and Murrough, and it is estimated that each boat gets about 2 dozen weekly, for which they get from 7*s.* to 10*s.* a dozen during the season. This does not prevent them carrying on other fishing at the same time. In the neighbourhood of Glenina or Murrough accommodation for canoes is greatly required, and improvements might be made at a very inconsiderable cost. At Finvarra a depot for lobsters, crabs and other shell-fish is about being established by an enterprising English firm, who will purchase any shell-fish offered to them in good condition. Crabs abound on this coast, but are not taken, as no sale for them. The opening of this depot will develop a trade in them. There have been no conflicts between the fishermen, who are orderly and peaceable. The trawlers, however, sometimes do great injury to the long lines, dragging through them. It is difficult to avoid them when they are not properly buoyed.

There are several public oyster banks on this coast. They are situated in Tyrone, Kinvarra, and Oranmore Bays; they are not improved. In Tyrone Bay about 45 boats dredged, and in the early part of the season realized from £1 to £1 15*s.* each per day, but in the latter portion only from 7*s.* 6*d.* to 10*s.* each boat. Very little were taken off Crusheen or Oranmore beds. There was only one month allowed for dredging on the public beds last year, and the weather was too severe to allow dredging to be much carried on during that month—December. There are also a number of private oyster banks in this district, but they are all fattening beds, and produce no spat. About £7,000 worth of oysters annually sold off them. In some places the French oysters have done remarkably well. Complaints are still made of the depredations committed by persons going along the shores in the neighbourhood of private beds, under pretence of gathering winkles, cockles, mussels, &c., and the expense of protecting the oysters is so great that it debars proprietors from laying out capital in more extensive cultivation. It is said these pickers carry away large quantities of oysters, even from beds held under a license. This is certainly a great drawback to a proper system of oyster cultivation.

Barna Station.—Claren Bridge to Crumlin, a distance of about 30 miles; unguarded from Claren Bridge to Blackrock, about 14 miles.

The principal fish captured are turbot, brit, sale, hake, glassen, and mackerel. Very good trawling ground, which is availed of by a large and successful fleet of trawlers. Large shoals of herrings and mackerel appeared in February and September. The herrings used to be caught with a rod and line off the pier at Barna; they were generally of a small description, and the nets were not suitable for them. Small quantities of lobsters and crabs were taken. The fishermen are peaceable and orderly.

The oyster fisheries are said to be improving. There were about 60 boats engaged at dredging, and earned from £3 to £5 each boat.

Costello Station.—Crumlin to Mace Head, about 120 miles; unguarded from Rossaneel to Mace Head, about 104 miles.

The principal fish are cod, ling, hake, pollock, pilchards, and mackerel. Mackerel are sometimes in great abundance. They appeared in large shoals in August and September close inshore, but the means of capture were not at all suitable. There is good trawling ground along the coast, which is fully worked. Lobsters and crabs are caught in large quantities. The crabs are not sold; they would not pay the carriage to market.

There are several private oyster beds in this division, but it is difficult to ascertain with any degree of accuracy in what state they are or the quantity of oysters sold. It is estimated at about £20,000 worth.

Arran Island Station.—In these islands there was an increase of 6 boats registered during the year, the total being 3 second and 40 third-class. Of these there were only 2 second and 29 third-class boats solely engaged in fishing, the rest only partially so. Large shoals of mackerel appeared during August, but the means of capture were totally inadequate. Cod, ling, and bream are the principal fish captured. A small quantity of lobsters are taken round North Arran, and at South Arran.

In the whole of the district the fishermen are spoken of as peaceable and orderly, and no conflicts.

Since the trawling boundary has been removed the trawlers have taken large quantities of plaice inside the line, within which trawling was prohibited for many years, but they really only frequent that part of the bay during the short period when plaice set in.

They find it more profitable to trawl outside.

Clifden Division.

Mason Island, County Galway, to Doaghbeg, County Mayo.

In this division there were registered 657 boats, employing 1,865 men and 48 boys, which were composed of 220 second and 437 third-class, all only partially engaged in fishing. This shows an increase of 116 boats in the division. The division extends for about 261 miles, out of which there are about 191 miles unguarded—the islands of Boffin, Shark, Turk, and nearly all the islands in Clew Bay.

Roundstone Station.—Mason Island to Ballinlina, about 62 miles; unguarded from Mason Island to Fishery Bridge, Ballyconneely, about 41 miles.

The principal fish taken are cod, ling, bream, and congers. Large shoals of mackerel and herrings appear off the coast every harvest, but there are no nets kept ready for their capture. A quantity of fine lobsters are taken, but not many crabs. It is stated that about 3,900 dozen of lobsters were taken during the season.

There are no public oyster banks on this part of the coast.

Bayleek Station.—Slyne Head to Streamstown, a distance of about 30 miles; unguarded from Clifden to Slyne Head, about 17 miles; also the islands.

The same modes of fishing and descriptions of fish as on other parts of this coast. Fishing not carried on regularly as a business. No shoals of fish have been seen off this part of the coast during the year. Very small quantities of lobsters are taken, but fishermen go to the county Mayo coast for this fishing, and remain out several weeks at a time in their open boats.

Cleggan Station.—From Streamstown to Renvyle, about 25 miles; unguarded from Streamstown to Weir, and from Letterfrack to Renvyle, about 13 miles.

Bream, skad, and mackerel are the principal fish captured. A few small shoals of mackerel appeared inshore in August and September; few captured. Only a small quantity of lobsters are taken.

There are private oyster beds in this division, some of which are reported as doing well.

Tully Station.—Renvyle to Roonagh, about 30 miles; unguarded from Rowa to Roonagh, about 20 miles. Mackerel, herrings, bream, coalfish, cod, and pollock are the principal descriptions of fish captured. Large shoals of mackerel appeared during August and September about a mile from the shore, and in Killary Bay, but the nets are not sufficient for their capture. About 100 dozen of lobsters were taken in the season.

Pigeon Point Station.—From Roonagh to Doaghbeg, a distance of about 114 miles; unguarded about 100 miles from Roonagh Head to Westport, and from Rosmoney to Doaghbeg, and all islands. Herrings, mackerel, bream, cod, ling, and pollock are the principal descriptions of fish taken. No large shoals have appeared this year off this part of the coast.

In the whole district the fishermen are reported as peaceable and orderly. No conflicts.

Keele Division.

From Doaghbeg to Doona, County Mayo, about 170 miles.

In this division there are registered 57 third-class boats, employing 122 men and 4 boys, all only partially engaged in fishing.

The past season off this part of the coast has been a bad one, the quantity of fish taken being much less than that of previous years. The fishermen are, as a rule, employed about farming, and only occasionally fish when it suits their purpose. The greater part of the men go to other parts of the kingdom early in spring, and do not return till autumn. The fishing is therefore greatly neglected, and the result is that only a small quantity of fish is captured, though it is thought by many the fish are as numerous as ever. Some, however, think they are not as plentiful.

Achilbeg Station.—Achilbeg to Doaghbeg and to Dooega, about 28 miles. Cod, whiting, and bream are the principal fish; cod principally in December, January, and February; whiting in April, May, and June. There was a very fair season in lobsters by the county Galway men, who frequent this part of the coast.

Keele Station.—From Dooega to Ridge Point, about 35 miles. Bream, pollock, congers, and mackerel are the fish most abundant. In July, August, and September large shoals of mackerel and herrings appeared about a mile from the shore; but there are not adequate means for their capture, as the fishermen have not craft or gear suitable. Only a small quantity of lobsters captured during the season.

Bullsmouth Station.—From Ridge Point to Achil Sound on the west, and from Doona Head to Ballacraher Bay on the east. None of the boats at this station fished for the purpose of sale during the year. Pollock is the principal fish taken.

In the whole division the fishermen are peaceable and orderly. No conflicts.

Belmullet Division.

From Doona Head to Butter Point, about 73 miles.

The same observations as in previous division are applicable to this. Fishing is only carried on occasionally, when it suits the people, who are mostly farmers. There are registered 183 third-class boats, employing 505 men; but they are all only partially engaged in fishing.

Claggan Station.—Geesalia to Belmullet, about 20 miles; unguarded, Geesalia to Doolough, about 2 miles. Small shoals of herring and mackerel appeared in August and September, half a mile to one mile off the shore. Nets not sufficient for their capture.

Tullaghan Station.—Geesalia to Monley's Point and round Doohoma, about 14 miles; unguarded from Goolamone to Doona Head, about 10 miles. Herrings are the principal fish taken, but no shoals appeared off the coast. Very little fishing done.

Ballyglass Station.—Erris Head to Shanahee Point, about 12 miles; unguarded, Seal Island to Butter Point, about 10 miles. Cod, ling, turbot, gurnard, pollock, mackerel and herrings, are the principal fish taken. In April large quantities of mackerel were captured, and since then smaller quantities of mackerel and herring, from about 200 yards to 1 mile from the shore in Broadhaven Bay. The means of capture are not adequate. Large quantities of lobsters taken by the county Galway men, who come round in the season.

Elly Bay Station.—From Ardelly Point to Annagh Head, about 15 miles; unguarded about 8 miles from back shore of Elly Bay to Annagh Head. Herrings, mackerel, and whiting are the principal descriptions of fish taken. Large shoals of herrings and mackerel appeared in July and October. The means of capture are not sufficient. Lobsters taken in large quantity by the county Galway men.

In the whole division the fishermen are reported as peaceable and orderly.

Ballycastle, County Mayo, Division.

From Butter Point, Broadhaven, to Bartragh Gap, Killala.

In this division there are registered 104 boats, employing 501 men, all third-class, and only partially engaged in fishing. Like the neighbouring districts, the people, for the most part, only fish as occasion suits. Although there is fine trawling ground, no trawler is employed for the purpose of capturing for sale. The only vessel that trawls is a yacht belonging to Sir Charles Gore, bart., who fishes for amusement, and takes a quantity of fine fish.

Ross Station.—Gap of Bartragh to Palmerstown Bridge, about 6 miles. Pollock, plaice, sole, mackerel, and herrings are the principal descriptions of fish taken. Mackerel appeared in large quantities in July and August, but the means of taking them were not sufficient. Herrings appeared in September in large shoals, and were captured in large quantities from a quarter to a mile off the shore.

Kilcummin Station.—Rathfran to Ballycastle, about 10 miles; unguarded, Lacken to Downpatrick Head, about 4 miles. Herrings and mackerel are the principal fish cap-

tured. Large shoals appeared from July to September, from 1 to 2 miles off shore; but there were no adequate means of capture. Lobsters and crabs were plentiful during the season, but no sale for crabs.

Ballycastle Station.—There are 7 boats at this station, registered by the Collector of Customs, that did not fish during the past year. Very little fishing carried on in this guard; pollock and coarse ground fish are those principally taken. A few lobsters were also captured by three boats from the county Galway.

Belderrig Station.—From Brandy Point to Glenuldra, about 30 miles; unguarded about 16 miles. Mackerel is the principal fish taken, and large shoals appeared in August and September about two miles off the shore, but there were no adequate means for their capture. Fishing only very partially carried on on this coast.

Portacloy Station.—The same remarks as the former station apply equally to this, save that at Portacloy a large quantity of lobsters were taken.

Pullendiva.

From Bartragh to Coney's Island, Sligo. About 59 miles.

In this division there are registered 46 boats, employing 165 men and 7 boys, all third-class boats, 10 of them only being solely engaged in fishing, and 36 only partially so. The men who fish along this coast have but bad boats and worse gear, and in consequence of no pier or shelter they seldom venture more than a few hundred yards from the shore. There has been a fair take of lobsters during the season—nearly 18,000, as nearly as could be ascertained, having been sent to market. There was also a fair take of pollock, and a few herrings, mackerel, and whiting. A boat slip is much required at Enniscrone, and some improvement also effected at Dromore Bay, as the boats are often damaged waiting for assistance up the beach, which is very steep. Since the introduction of loans an impetus has been given to fishing in parts of this coast, particularly for lobsters.

Enniscrone Station.—Ballina to Carrenduff, about 12 miles. Herrings, mackerel, whiting, sole, brit, turbot are the principal descriptions of fish taken. Herrings in the largest quantities; more turbot has been taken last season than for many years past. A good quantity of lobsters were also taken at Lacken and Carrowhubbuck.

Pullocheeney Station.—Carnduff to Easkey, about 7 miles. Mackerel and herrings are the principal fish, and they appeared in large shoals in July and August close inshore, and were captured in large quantities. There are better means for capture here, but the nets require to be made deeper. A good quantity of lobsters were taken.

Pullendiva Station.—Easkey to Dunmoran, about 13 miles. Herrings, mackerel, and pollock are the principal descriptions of fish taken, but herrings in the largest quantities. Several large shoals of mackerel appeared in June and July off Dromore, and herrings in September, but very few were taken in consequence of insufficient gear. A very fair catch of lobsters took place. They were sent principally to the Dublin markets. It is reported that there is plenty of fish along this coast, but the people have not the means to procure boats and gear.

Derkmore Station.—Dunmoran to Coney's Island, about 25 miles. Pollock, flat-fish, cod, gurnard, and herrings are the principal descriptions taken, but all only in small quantities. A few shoals of herrings appeared off Dunmoran in August and September close inshore, but only a small quantity were captured.

A good quantity of lobsters of a very good quality were taken during the season, as near as can be ascertained, about 300 dozen, which were sold from 7*s.* 6*d.* to 8*s.* 6*d.* per dozen.

There is a public oyster bank in this guard which is said to be improving, and that the spatting was greater last than the previous season; however, only a small quantity, about £50 worth, is taken.

There are some important private oyster beds in the division.

In the whole division the fishermen are reported as peaceable and orderly.

Sligo District

Strandhill, Sligo, to Donegal Abbey.

In this division there were 139 boats registered, employing 577 men and 8 boys, of which there were 1 first, 13 second, and 17 third-class solely engaged in fishing, and 9 second and 99 third-class only partially so engaged. This shows a reduction of 10 boats since last return, which has been caused by 8 boats at Rosse's Point and 2 at Rockley being broken up or their registers returned, as the boats are not used for the purposes of fishing for sale. The return now made approaches accuracy more than those of former

years. The fisheries in this division are reported as decreasing. The long line fishing at Mullaghmore was not so good during the past year, and there has been hardly any herring or mackerel fishing. The fishermen at Bunnatrohan, Co. Donegal, are at a great loss for some refuge for their boats.

Rosse's Point Station.—Strandhill to Drumcliffe, 18 miles; unguarded, Strandhill to Sligo, and Lower Rosse's Point to Drumcliffe, about 11 miles.

Oyster dredging is really the only regular description of fishing practised. A public bed exists in Sligo river, but it is not improving. It has been stated that it is hardly worth while dredging now, so few oysters are taken in the season. Cod, ling, pollock, &c., are taken in large quantities by the Rockley fishermen. Some large shoals of herrings appeared off the coast during September, and they are looked for from that time till February.

Rockley Station.—Drumcliffe to Cullimore Point, about 17 miles; unguarded, Drumcliffe to Lissadill, about 6 miles.

Flat-fish, cod, ling, mackerel, and herrings are the principal fish captured. Large shoals of mackerel appeared off the coast during August and September, about half a mile off the shore.

There were no adequate means of capture. Herrings appeared in October and were captured in some quantity, but nothing of any consequence. A good quantity of very fine lobsters and crabs were captured off Ballyconnell, Brown's Bay, and Rockley. At the latter place the harbour which was originally built at the public expense, and was transferred to the Grand Jury, is being allowed to get into a state of delapidation, and it is stated will be a great loss to the fishermen.

Mullaghmore Station.—Streedagh to Bundoran, including Innishmurray Island, about 23 miles, and 8 to the Island; unguarded, Streedagh to Rockuragh and Bunduff to Bundoran, about 18 miles.

The same descriptions of fish are taken on this part of the coast. Several small shoals of mackerel, but no herrings or pilchards, appeared in Mullaghmore Bay about half a mile off, in August, but the nets used are not deep enough unless the fish come close inshore.

Large quantities of lobsters were taken, but they were found in largest quantities by the Mullaghmore men off the coast along Derkmore, Pullendiva, Pullocheeney and Enniscrone, and Innismurray Island. There are four private oyster beds in this guard, but they are not improving.

Ballyshannon Station.—Bundoran to Eske River, Donegal, about 30 miles; unguarded nearly the whole coast.

Herrings, mackerel, cod, ling, plaice, whiting, and bream are the fish taken. Small shoals only of herrings and mackerel appeared this year a quarter to two miles off the shore. No quantity was captured. Lobsters and crabs were captured in good quantity at Kildoney and Bunnatroohan. At the latter place the harbour requires something of improvement to afford shelter for boats. At present it is in a bad state of repair and a great loss to the fishermen, being their only place of refuge on this part of the coast. The fishermen complain also that they are not allowed to reap any of the advantages offered to fishermen in the neighbouring county by loans for repairs of boats and providing suitable fishing gear.

In the whole division the fishermen are peaceable and orderly, and no conflicts.

Killybegs Division.

From Donegal Quay to Lower Ferry, East, county Donegal.

There were, in this division, in 1878, 168 boats, employing 783 men, and 58 boys, as compared with 145 boats, 680 men, and 88 boys, in 1877.

Nets and long and hand lines are the means of capture.

Herrings, mackerel, whiting, cod, and other fish are taken.

The boats, however, in this district are too small for successful fishing, and the gear requires to be better in order to enable the fishermen to pursue their avocation at a greater distance from the coast.

Lobster fishing has been good throughout the district, and very considerable quantities of lobsters have been caught during the season.

The fishermen are very orderly.

The extent of coast line is 140 miles, of which about 16 miles are unguarded.

Guidore Division.

From Gweebarra Bar to Mullaghdoo.

There were, in this division, in 1878, 42 boats, employing 133 men, and 16 boys, as compared with 37 boats, 104 men, and 13 boys, in 1877.

Nets and long and hand lines are the means of capture.

Large quantities of mackerel were seen round the islands in June, July, and August, but, from want of adequate means of capture, including a larger class of boats, very few were taken.

Lobsters and crabs were captured in large quantities—more than £1,000 worth having been sold during the season.

The conduct of the fishermen was excellent.

The extent of coast line is 33 miles, of which about 12 miles are unguarded.

Rathmullin Division.

From Lough Swilly to Bloody Foreland.

There were in this Division, in 1878, 186 boats, employing 345 men and 23 boys, as compared with 158 boats, 423 men, and 31 boys in 1877.

Herring and mackerel have appeared in large quantities off some portions of the coast, but were not captured in any numbers, in consequence of adequate means not existing. Cod, ling, flounders, and other fish, are taken.

Lobsters and crabs were not taken in any considerable quantity, so far as can be ascertained, except round the coast of Horn Head and Sheephaun Bay. The fishermen have been orderly in their conduct.

In this district, also, the fishing might be largely developed if suitable boats and gear were provided.

The extent of coast line is 120 miles, of which about 25 are unguarded.

Moville Division.

From Inch Embankment, county Donegal, to Magilligan Point, county Derry.

There were in this District, in 1878, 213 boats, with 768 men and 4 boys, as compared with 118 boats, 626 men, and 4 boys in 1877, as recorded in last Report.

Hand and long lines are used in the capture of fish.

Turbot, bream, cod, whiting, and other fish were taken in considerable quantities, and herring in a less degree.

Lobsters and crabs were captured in considerable quantities in the localities of Portnasantally and Portaleen. About 2,016 lobsters and 15,524 crabs were taken in these places; and about 1,920 lobsters and 2,400 crabs were taken by four boats, between Stroove Head and Tremone Head.

It is to be regretted that a disposition has been shown by some of the fishermen in Lough Foyle to encroach on the several fisheries in pursuit of salmon. This has given the Coast Guards some trouble, as they have not sufficient men at the stations to ensure proper inspection of fishing boats at night.

The extent of coast line is 36 miles, of which 22 are unguarded.

Oyster Fisheries.

The oyster banks, between Roe River and Clare River, are not improving.

Ballycastle Division.

From Downhill, County Londonderry, to Jenny's Bridge, County Antrim.

There were 140 boats, 270 men, and 4 boys employed in 1878, as compared with 143 boats, 263 men, and 6 boys, in 1877.

Draft-nets, long lines and hand lines are employed in the capture of fish.

Mackerel, pollock, cod, ling, bream, and skate are taken in some quantity.

Lobsters and crabs are caught in considerable numbers, principally between Gob Colliery and Fair Head.

The fishermen of this district are orderly and peaceful.

The immense destruction of river fish, by pollution of flax water throughout the country, has been supplemented here by the loss, in one instance, from this cause, of 100 crabs, near the mouth of the Margy river. Lieutenant Chapman, R.N., in an interesting letter, deals ably with this subject.

The extent of coast line is about 55 miles, of which about nine are unguarded.

Carrickfergus Division.

From Jenny's Bridge to Fort William Park, near Belfast.

In this district, 51 boats, 114 men, and 4 boys were engaged in fishing, in 1878, as compared with 47 boats and 95 men in 1877.

The modes of capture are seines, long lines, hand lines, rods, draft nets, herring nets, and trawls. There is good trawling ground all over Belfast Lough, and it is greatly taken advantage of.

Shoals of herrings appeared off the coast at Ballygally about the middle of August, and very large shoals of herrings appeared off the coast at Whitehead in June and July; but there were no adequate means of capture. Cod, ling, sole, and pollock are also taken.

Lobster and crabs were captured in large quantities in Carnlough and Glenarm Bays: about 4,000 of each were taken during the year.

The fishermen are very orderly and well-conducted.

The extent of coast line is 53 miles, no portion of which is unguarded.

Oyster Fisheries.

Oysters are taken all over Belfast Lough. There is one public bed, about one mile in extent, S.S.E. from Whitehead. The amount realized from the oysters taken during the year was about £900. The oysters are generally large, but small quantities of a lesser size are also sold.

Donaghadee Division.

From Tillysburn Head, County Antrim, to Newcastle Quay, County Down.

During 1878, 124 boats, 392 men, and 28 boys were employed, as against 105 boats, 366 men, and 10 boys in 1877.

The modes of fishing practiced are by hand lines, long lines, occasional trawling, drift nets, and seine nets.

Cod, plaice, whiting, pollock, and, in some places, herring are captured. Shoals of herring appeared during the summer about three miles from shore, off Millisle, but were not taken in any quantity from want of adequate means of capture.

About £100 worth of lobsters and crabs were taken during the season by four Groomsport boats; and a small number in the Millisle locality.

The fishermen in this district are orderly. The extent of coast line is 44 miles.

Strangford Division.

From Newcastle Quay to Sheepland Head.

In 1878, 107 boats, 189 men, and 10 boys were employed, as against 101 boats, 165 men, and 15 boys in 1877.

The modes of capture are nets and hand lines. There is no trawling.

Herrings, mackerel, and cod were taken.

Lobsters and crabs were not taken in large quantities. For three months in the year, about one hundred a week were taken, off Killard Point.

The conduct of the fishermen was good.

Oyster Fisheries.

No oysters were sold in the district this season. Strangford Lough used to produce a considerable quantity of oysters; and it is hoped that their culture may be taken up again, and banks stocked and preserved. Many facilities are afforded, by Strangford Lough, for the successful production of oysters.

Newcastle Division.

From Sheepland Head to Riverfoot, Kilkeel.

There were employed, in this district, in 1878, 157 boats, 642 men and 33 boys, as compared with 141 boats, 521 men, and 29 boys, in 1877.

The modes of capture are by trammel nets, hand lines, and long lines.

The herring fishery, in connection with Ardglass, is referred to elsewhere. There is good trawling ground six miles S.E. of Annalong, which has lately been much used.

Turbot, whiting, mackerel, haddock, cod, ling, sole, plaice, and other fish are caught largely off Ardglass.

This harbour is now being carried towards completion, and will be of incalculable advantage, not only to the district, but to the country at large.

Lobsters and crabs were taken, in some quantities, in the neighbourhood of Ringfad Point. About 500 of the former, and 1,000 of the latter were captured. About the same number was taken between Annalong and Black Rock.

The fishermen in the district are orderly.

The extent of the coast is about 42 miles, no part of which is unguarded.

Carlingford Division.

From Riverfoot, Kilkeel, county Down, to Maiden Tower, Drogheda.

In 1878, 266 boats, 876 men, and 68 boys were employed, as compared with 277 boats, 915 men, and 52 boys, in 1877.

The modes of capture are nets and long lines.

Mussels are taken in considerable quantities in the River Boyne.

Herrings, cod, plaice, turbot, and whiting are captured.

Lobsters and crabs, in certain portions of the district, are reported to be taken in some numbers, though accurate returns have not been obtained.

The conduct of the fishermen generally has been orderly. An exception seems to have occurred in the Carlingford Coast-guard Station, where fishermen from Arklow made themselves troublesome.

The extent of the coast is about 85 miles, of which about 2 miles are unguarded.

Oyster Fisheries.

The principal public oyster fisheries are in Rostrevor Bay, and from the Black Rock to Baliyonan Quay. They are said to be improving, and the spatting was greater than in 1877.

Malahide Division.

From Laytown to Baldoyle.

In 1878, 96 boats, 452 men, and 22 boys were employed, as compared with 93 boats, 426 men, and 18 boys, in 1877.

The modes of capture are trawling, long lines, hand lines, and herring nets.

Herrings, turbot, plaice, cod, and ling are taken.

Lobsters and crabs have been taken in the Skerries district.

Trawling within the limits has prevailed to a considerable extent, and it is desirable that increased efforts should be made to put down this practice. The Coast Guard will, no doubt, continue their exertions in this direction.

The extent of the coast is about 26 miles, none of which is unguarded.

Irish Reproductive Loan Fund.

Mr. Brady's Report for the Counties of Leitrim, Sligo, Mayo, Galway, Clare, Limerick, and part of Kerry.

County Leitrim.

In this county there was a sum of £332 available for loans for the year 1878. There was one application received for £10, and it was recommended, but was never taken up by the borrower, and was therefore cancelled. Only a few persons living on the small seaboard of this county follow fishing.

County Sligo.

In this county there was a sum of £449 available for the year.

There were 32 applications received from 41 persons, amounting to £551 12*s.* 6*d.* There were only 19 loans recommended, amounting to £275, and out of this sum only £267 were issued, the balance not having been taken up. In one case out of these I was obliged to recommend the loan of £24 to be recalled in consequence of the money not having been properly applied. The loans ranged from £5 to £24, and were on the whole fairly expended. I had some difficulty in causing a proper

expenditure in some cases, and I have felt obliged to recommend that no further loans should be given to certain persons who had already obtained loans in consequence of the manner in which their former loans were expended.

When the money has been fairly expended on the matters for which it was lent, it has proved of incalculable benefit to the fishermen.

There have been no arrears of payment of instalments of the loans made in either 1877 or 1878, but there are three cases of loans made in 1875 where the instalments are in arrear, amounting to £12 0*s.* 6*d.*, and three of those made in 1876, amounting to £5 11*s.* 7*d.*, making a total of arrears of £17 12*s.* 1*d.* up to 31st December last.

The total amount issued in this county for four years was £1,078, out of which there have been repaid £565 10*s.* 11*d.*

County Mayo.

The amount available for this county was £606.

There were 88 applications received from 168 persons, amounting to £1,373. Out of these there were 51 loans recommended, amounting to £622. There were 2 loans afterwards cancelled amounting to £28. The total amount issued on account of these loans was £558. The balance of £36 was not taken up by the applicants, and was therefore cancelled. The loans ranged from £5 to £36.

On the whole, so far as I have been able to ascertain up to the present, the money issued was fairly expended, and proved of great use to the people.

The persons to whom loans were made in this county are of a miserably poor class, and it is not at all surprising that there should be arrears of repayments in many cases. Still, considering their poverty and the depressed state of the country during the year, I do not think that the arrears are excessive. There were out of loans made in 1875, instalments in arrears on the 31st December last, in 6 cases, amounting to £23 16*s.* 8*d.*; out of loans made in 1876, instalments in arrears in 6 cases amounting to £22 4*s.* 5*d.*; out of loans made in 1877, instalments in arrears in 2 cases, amounting to £4 2*s.* 4*d.*; no arrears of loans made in 1878. Total of arrears in the county, £50 3*s.* 5*d.* Although this amount is small, I cannot understand why it should be left overdue. In one case an instalment is due since August, 1876. Very close inquiry was made as to the solvency of the sureties before making the loans, and I believe in very few cases will it be found that they are insufficient, if proper steps be taken to enforce payment.

The total amount issued for the 4 years in this county was £2,636, out of which there have been repaid £1,383 2*s.* 2*d.* One loan made in 1877, amounting to £12, was recalled in consequence of the money not having been properly applied.

Co. Galway.

There was a sum of £1,077 available for this county for the year 1878. There were 188 applications received from 401 persons, amounting to £3,667 19*s.*, out of which there were 87 loans recommended amounting to £1,058 ranging from £5 to £32. I had more difficulty in enforcing the proper expenditure of the loans in this county than probably in any other. Before recommending any of the loans I made the closest personal investigation in the locality into every application received, and selected those applicants which required the money most, and were most likely in my mind to turn it to proper account. I could safely have recommended a much larger sum were it available. The selection obliged to be made, out of so many applicants—401—for so small a sum of money, entailed, I need hardly say, a vast amount of time and attention, and could hardly be done without incurring invidious remarks from many who think that, because they have recommended loans, they should be at once made, without reflecting on the vast number of applications for the amount available.

I was obliged to recommend that loans made in 1877, in 12 cases amounting to £156, should be recalled in consequence of the money not having been properly applied. I am quite sure that as much precaution as possible was used in recommending these loans; but it is quite out of our power to insure that in all cases the money will be properly expended. In every case that we can find out that it has not been—and the expenditure of each loan is strictly inquired into—the parties are at once proceeded against for the repayment of the entire loans.

Up to the present I have not been able, from other duties, to investigate the expenditure of the loans made in 1878, except in a few cases, and I am glad to say they have on the whole been satisfactory. I have not been obliged to recommend any loans to be recalled.

The loans proved of great use to the people, and, when fairly expended, have contributed to increased fishing and improved gear.

There were, up to 31st December last, arrears of instalments of loans made in 1875 in one case amounting to £5 5*s.*; out of loans made in 1876, arrears in eight cases amounting to £16 19*s.* 6*d.*; out of loans made in 1877, arrears in one case amounting to £1 0*s.* 9*d.*; none in 1878. Total arrears, £23 5*s.* 3*d.* The total amount issued in this county for the four years was £4,335 10*s.*, out of which there have been repaid £2,558 19*s.* 7*d.*

County Limerick.

The sum available for this county was £625.

There was one application received for a loan of £6, but from the inquiries I made, and the confidential reports received, I could not recommend this to be made, although the most unexceptionable security for the repayment was offered by the applicant.

There are no *bona-fide* fishermen living in this county. Those who follow fishing generally fish for salmon, for which no loans are recommended.

County Clare.

In this county there was available a sum of £343. There were 38 applications received from 55 persons, amounting to £495. Out of these there were 25 loans recommended, amounting to £282, ranging from £5 to £20.

The amount issued was £270. One loan amounting to £12 was cancelled.

I was obliged to recommend loans to be recalled in nine cases out of those made in 1877, amounting to £102, in consequence of the money not having been applied to the purpose for which it was lent. In this county also I experienced great difficulty in enforcing a proper expenditure of the money; but I can with safety say that, except in the cases mentioned above, the several loans have, on the whole, been fairly applied. There were up to 31st December last, arrears of instalments of loans made in 1875, in four cases, amounting to £5 11*s.* 4*d.* Out of loans made in 1876, arrears in one case amounting to £2 2*s.*; out of loans made in 1877, arrears in seven cases, amounting to £17 5*s.* 1*d.* Total arrears, £24 18*s.* 5*d.*

The amount issued in this county for the four years was £1,320, out of which there have been repaid £668 0*s.* 5*d.*

County Kerry.

From that part of the county included in my district there were 15 applications received from 18 persons, amounting to £294 12*s.*, out of which there were 13 loans recommended, amounting to £206. The amount actually issued was £179, the balance of £27, in two loans, having been cancelled for not being taken up in proper time.

I have not been able as yet to investigate the expenditure of the loans made, but this shall be done as speedily as other business will permit.

There are no arrears of instalments in this part of the County Kerry.

General Remarks.

So far, I think the Act of Parliament affording loans to fishermen has proved a success, and an impetus has been given to fishing operations. It is to be regretted that they are not carried out on the west coast on an extensive scale, instead of the uncertain, spasmodic attempts that are made by the poor people living near the coast. This class of persons is unsuitable for large undertakings by themselves, though they might be made useful to others who would enter into the enterprise, which, to command success, must be carried out by the personal superintendence, labour, and active exertions of the principals themselves. Until such people are found, it is well to foster the industry of the poorer classes who now follow fishing on the west coast, and who at seasons are enabled to bring additional supplies of food into the country.

Without the loans, I have no hesitation in saying that many of them would have been obliged to have abandoned fishing long ago. I should like to see the loans extended to the other maritime counties where they are not now available, and where they would be a great boon to many.

I cannot help saying, in conclusion, that I believe much of the arrears of instalments has been caused by inactivity in enforcing repayment, though I would be glad to see indulgence given in really deserving cases. The security taken in each case that has come under my knowledge has been favourably reported on by those from whom I made

confidential inquiries, and who were competent to give an opinion. I cannot therefore understand why arrears of instalments should be allowed; one even so far back as August, 1876. On this matter we have felt it our duty to correspond with the Board of Works, who alone are chargeable with the issues and recovery of payments.

I cannot conclude this report without acknowledging the very great and valuable assistance I have received at all times from the country gentlemen and others to whom I have felt it necessary to apply for confidential information on many occasions.

THOS. F. BRADY.

IRISH REPRODUCTIVE LOAN FUND.

MAJOR HAYES' REPORTS FOR THE COUNTY OF CORK AND THAT PART OF THE COUNTY OF KERRY LYING BETWEEN DURSEY ISLAND AND BALLYDAVID HEAD.

COUNTY OF CORK.

Amount available for loans for 1878 was £859. Fifty-eight applications were received, the total sum applied for being £1,872 10*s.* Of these, seventeen were recommended, one was declined, and sixteen were issued for the full amount available.

All the instalments due up to 31st December, 1877, have been paid.

Of the thirty-six loans recommended in 1876—in twenty-nine the sums lent were expended satisfactorily; two were not expended properly, and were recalled; one was not taken up, and in four cases the expenditure has not been ascertained.

In 1877, of the thirty-two loans recommended for the full amount available, twenty-six were expended satisfactorily, one doubtful, and five not having been so expended have been recommended to be recalled.

In 1878, of the seventeen loans recommended, fourteen have been satisfactorily accounted for, one cancelled, and two not having been expended properly have been recalled.

There are instalments overdue on seven loans, amounting altogether to £36 15*s.*, in four of these cases proceedings have been taken to recover the amounts due, and decrees have been obtained. In the other three the instalments only became due on 1st December last, and will probably be paid in a short time.

This result, after four years in which the Act has been in force, must, I think, be considered very satisfactory.

COUNTY OF KERRY.

Total amount available for 1878 was £2,450. In that part of the county situated in my division one hundred and thirty-seven applications were received, the amount applied for being £3,538. Of these I was able to recommend eighty-seven, for an aggregate sum of £2,261.

In last year's report it was notified that only four instalments of loans, due up to 31st December, 1877, remained unpaid, for a total sum of £13 12*s.* 4*d.*; two of these have since been paid.

Of the nineteen loans made in 1876, seventeen it has been ascertained have been correctly expended, and two, not having been properly spent, have been recalled.

Of the six loans made in 1877, four were properly expended, the other two, although not very satisfactorily accounted for, it was not deemed necessary to recall.

In 1878, eighty-seven loans were recommended; of these forty-five were correctly accounted for, two not quite satisfactorily, and eight were recalled as not properly expended.

One loan was not taken up, twenty-four were issued so late in the year that they have not been yet inquired into, and seven were cancelled from various causes.

Up to the 31st December last, after the Act had been in operation four years, 213 loans have been made for a sum in the aggregate of £5,951. The payments to that date amount to £3,196 9*s.* 7*d.* The instalments in arrears up to the present time number nine, amounting to £56 1*s.* 6*d.* The remainder of the sum issued, however, will not be due for a considerable period.

In the ten cases in arrears prosecutions have been taken in eight, and decrees obtained for the several amounts against the persons in default. The other two only became due on the 1st December last.

I fear that in two cases a loss will accrue, although every precaution was taken before recommending the loans, and the parties were believed to be in every way eligible, and that the loans would be repaid.

MR. BRADY'S REPORT.

On Division of Ireland extending from Dunmore Head, in the county of Kerry, to Mullaghmore, in the county of Sligo, embracing in whole or part the counties of Kerry, Clare, Limerick, Tipperary, King's, Queen's, Galway, Longford, Westmeath, Roscommon, Leitrim, Mayo, Cavan, and Sligo.

No. 8, or Limerick District.

Extends from Dunmore Head, in the county of Kerry, to Hag's Head, in the county of Clare, and includes all that part of the country the waters of which flow into the sea coast between those points.

The general condition of the salmon fisheries is satisfactory; though the take of fish during the season of 1878 was less productive than that of 1877. No cause can be assigned for the diminished capture. As I have stated in former reports the actual quantity of fish captured during any year cannot be ascertained, there being a reluctance on the part of most proprietors or lessees of fisheries to give any returns, and the public, who preponderate largely in the open waters of this district, will not do so. The average weight of the fish taken has increased very much of late years. This is owing to the protection afforded to the spent fish when descending. A 40 lb. salmon in the Shannon is now of no uncommon occurrence.

The engines fishing in the public waters of the district have again increased in number this year, while there has been at the same time a great increase also in the number of rods. No complaints have been made of the want of fish in the upper waters, though in some places the angling during the year was not good, while in the higher reaches of the Shannon some large captures were made. The highest price obtained for salmon was 1*s.* 6*d.* per lb., and that for peale or grilse was 1*s.* The average price for the former was about 1*s.* 3*d.*, and for the latter about 9*d.*

In former reports I entered fully into the capabilities of this district to produce a much larger quantity of salmon than is at present captured, and the wants of the district generally, and to which I beg to refer. Nothing has occurred to alter any of the opinions I therein expressed.

During the past year several inquiries have been held by myself and my colleagues into various matters connected with the district.

Amongst the rest, in consequence of a representation from the Board of Conservators that there was a difficulty in obtaining convictions for breaches of the by-law prohibiting drift nets inside the low water line of ordinary spring tides in Clonderlaw Bay, a public meeting was held at Kilrush to inquire into the subject, but no evidence was offered so as to enable us to make any alteration in the law, even if such were required. We therefore were obliged to dismiss the application and leave it to the Board of Conservators to take the necessary steps to have an adjudication by a competent tribunal on the points in dispute with regard to the by-law—that is, if its provisions have reference to Clonderlaw Bay.

The by-law prohibiting netting in the River Deel or Askeaton has proved of great use. The river is kept exclusively for angling purposes, and, while it forms a most important feeder to the commercial interests of the Shannon, it has amply repaid in sport the proprietors for the interest they have taken and the money they have expended in its improvement. It can be still more improved by some further outlay, and I know of no set of proprietors on a river in Ireland more deserving of support from the public funds of a district than those on the banks of this river. It is seldom that proprietors can be got to expend money on the improvement of rivers, but in this case they have by their exertions made this river in a few years a most important one. They therefore deserve and should obtain from the Board every encouragement to increased exertions.

The case of the mill dam erected on the River Feale, to which I referred fully in former reports as having been raised in height, and now forming a greater obstacle to the passage of fish than the old dam, has been laid before the Law Officers by your Grace's directions, in accordance with our desire. We have been advised that, although the question raised may be very important, it is one more involving local than imperial interests, and calling rather for the expenditure of local than imperial funds. Immediately we caused an urgent representation to be made on the subject to every member of the Board of Conservators, as we considered

it to be one of vital importance, not only to the upper water fisheries of the river, but to the large commercial and public interests which at present exist in the tideway; and urged again on the Board our conviction that matters should not be left in this state, but that whatever steps were necessary to enforce compliance with the Act, which required that all dams or other erections in rivers since 1842 should be so built or constructed as to allow of, in one or more places, the free ascent of fish, should be taken before further injury was done to the public fisheries.

The Board of Conservators considered the question at a meeting of their body on the 4th November last, when my colleague, Major Hayes, attended to afford the fullest information on the subject.

The Clerk of the Board was directed to make application to the proprietors and others interested in the fisheries of the river above the mill dam for funds to enable the Board to consider what steps should be taken to require a proper fish pass to be made in the dam. I have since learned that something under £2 was offered to be subscribed. The fact is, the commercial interests in the tidal parts of the river, which are enjoyed by the public, so preponderate over those in the upper waters, that it is hard to expect the upper proprietors to subscribe towards an object from which, even if successful, they may derive, comparatively speaking, little advantage.

The public who fish in the tidal waters are, generally speaking, a poor class of people, and consider they have contributed quite sufficiently towards every object when they have paid the License Duty of £3 on their nets. The Board of Conservators have not the funds at their disposal sufficient for protection alone, without involving themselves in what might turn out to be expensive litigation, the results of which might be uncertain; and they allege further, that the offence of erecting dams in rivers without complying with the provisions of the law in not providing fish passes, is not applicable peculiarly to the Limerick District more than to any other in Ireland; and therefore it would be unjust that their funds alone should be expended in settling a question of law applicable to the whole country. We are strongly of opinion that if the erection of dams in rivers, without sufficient passes for the fish, be permitted with impunity, the public must eventually suffer by the diminished supply of fish. That this was the feeling of the Legislature, when it provided that no dams should be erected after the passing of the Act of 1842, unless there were attached to them such facilities for the free ascent of the fish as would be approved by the Commissioners, there cannot be a doubt; but the omission to provide a penalty for non-compliance with the law, requires, as has been decided, that the proceedings should be by indictment. No private individual or Board of Conservators in Ireland, we believe, will be found to have recourse to this uncertain settlement of an important public question—one which must have a vital effect on the supply of valuable food for the public, and which has been already proved so in the case of most of the rivers in England.

As I stated in a former report, I believe the salmon fisheries of Ireland are at present too valuable a commercial commodity to permit, with impunity, any infraction of the requirements of the statute, because there are no local funds available to put the law in motion. So long as no summary remedy by proceeding for such offences in a similar manner to others is not provided, we are of opinion that the matter should be taken up at the public expense, as being one which affects the public most materially.

In my last and former reports I referred to the practice existing in this district of owners of fixed engines removing them to situations other than those shown on the certificates. The parties were cautioned against a repetition of what were considered offences against the statute. We were advised that the establishment of fixed engines in substantially different situations from those specified in the certificates was an illegal practice; that the proper proceeding was to enforce the penalty under 16th section 32 and 33 V., c. 92, and that, if the justices had any difficulty in convicting, they should be required to state a special case for a Superior Court.

Some of these engines were removed distances varying from a quarter to nearly a mile from the situations specified. The Board of Conservators were remonstrated with against allowing these practices; but they had no funds to justify them in undertaking litigation, particularly as it did not interfere with the general supply, and suggested that it was the province of the Inspectors to hold an inquiry, first summoning the persons before them and issuing an order for the abatement of the engine. The matter was again submitted, and we were advised that the question of law involved could not be properly made the subject of judicial decision by the Inspectors, and that the proper proceeding was by summons before magistrates, and that the Local Board of Conservators, or some individual affected, should be the prosecuting party. The Board have declined doing so. We have no power to compel them.

To allow matters to go on in this way will have the effect of rendering the

provisions of the Acts of 1863 and 1868 a nullity, and it becomes our duty to bring the subject now before your Grace.

In my former report I mentioned the very uncertain and unsatisfactory state of the law as regards fixed engines, and to the system allowed by the Board of Conservators of permitting them to be fished for several months without payment of license duty, and to which I beg now to refer.

During the season there were used in this district the following engines :—271 single salmon rods, 43 cross lines, 31 snap nets, 73 draft nets, 137 drift nets, 17 pole nets, 33 stake nets, 1 head weir, 9 boxes or cribs, 133 gaps or eyes for taking eels, producing a total revenue of £2,254 5*s.*, which, though appearing a large sum, is inadequate to the requirements of this large district.

There were 48 water bailiffs during the open, and about 105 during the close season employed by the Conservators, at wages ranging from 5*s.* to £1 per week. Only a few employed by private individuals, and these only to watch trespassers.

During the year there were 110 prosecutions by the Conservators, and 95 convictions obtained; by the Constabulary and others, with the assistance of the secretary of the Conservators, 29, of which 21 were convicted. Offences against the fishery laws appear not to have increased, while there is no perceptible diminution.

The close seasons in this district are—For tidal and fresh waters :—

"Between 31st July and 12th February, save rivers Cashen and Tributaries, and save between Kerry Head and Dunmore Head, and Loop Head and Hag's Head, and all rivers running into the sea between those points.

"For Cashen down to its mouth and Tributaries, between 31st August and 1st June; between Dunmore Head and Kerry Head, and all rivers flowing into the sea between those points, between 15th September and 1st April; between Loop Head and Hag's Head, and all rivers running into the sea between those points, between 15th September and 1st May."

For angling with single rods and lines :—

"Between 30th September and 1st February, save Cashen and Maigue rivers and their Tributaries; and save all rivers running into the sea between Loop Head and Hag's Head, and between Dunmore Head and Kerry Head. For Cashen and Tributaries, between 31st October and 16th March; for Maigue and Tributaries, between 30th September and 20th February; between Loop Head and Hag's Head, between 30th September and 1st March, and between Dunmore Head and Kerry Head, between 30th September and 1st April."

The bye-laws in force in the district are as follows :—

In River Shannon :—

"Prohibiting net fishing in that part of the River Shannon between Wellesley-bridge and the Railway bridge, between 1st June and 12th February.

"Prohibiting between the 1st day of August, or such other day as may be the first day of the close season, and the 1st day of November in each year, the use of draft nets, or any other net or nets used as a draft net, having a foot-rope and leads or weights affixed thereto, within the following limits, viz. :—In that part of the River Shannon situate between the Fishing weir known as the Lax Weir, and a line drawn due north and south across the said River Shannon at the western extremity of Graigue Island.

"Prohibiting draft nets for the capture of fish of any kind, of a mesh less than one and three-quarter inches from knot to knot, to be measured along the side of the square, or seven inches to be measured all round each such mesh, such measurements being taken in the clear when the net is wet, in the tidal parts of the River Shannon, or in the tidal parts of any of the rivers flowing into the said River Shannon.

"Prohibiting the fishing for salmon or trout by any means whatsoever, within a space of twenty yards from the weir wall of Tarmonbarry, on the River Shannon.

"Prohibiting having nets for capture of salmon or trout on board any cot or curragh between mouth of Shannon and Wellesley-bridge, in the city of Limerick, or in tidal parts of any rivers flowing into the said River Shannon between said points, between the hours of nine o'clock on Saturday morning and three o'clock on Monday morning; or between Wellesley-bridge and the Navigation Weir at Killaloe, in the county of Clare, between eight o'clock on Saturday morning and four o'clock on Monday morning.

"Prohibiting the shooting of fish in that part of River Shannon between Portumna-bridge and Shannon-bridge."

In River Shannon and Clonderlaw Bay :—

"Regulating the use of drift nets as follows :—

"First.—That no drift nets of greater length than 100 yards shall be used for the capture of salmon or trout in any part of the River Shannon between Limerick and a line drawn across the river below Askeaton, from Aughnish Point, in the county of Limerick, to Kildysart, in the county of Clare.

"Second.—That no drift nets of greater length than 200 yards shall be used for the capture of salmon or trout in any other tidal waters of the River Shannon, or in Clonderlaw Bay.

"Third.—That no two or more drift nets shall be attached together in any way or be allowed to drift within 150 yards of each other in the River Shannon, or in Clonderlaw Bay.

"Fourth.—That no drift nets below, or seaward of a line drawn across the River Shannon, from Aughnish Point, in the county of Limerick, to Kildysart, in the county of Clare, shall be used within the line of low-water mark of ordinary spring tides.

"Fifth.—That no drift nets shall be used in Clonderlaw Bay above a line drawn from Knock to Lacknabahee, in the county of Clare.

"That no drift nets shall be used in the Rivers Maigue or Askeaton."

In Lough Ree :—

"Permitting the use of nets, having a mesh of five inches in the round, measured when the net is wet."

In River Fergus :—

"Prohibiting the fishing for salmon or trout by any means whatsoever, within a space of twenty yards from the weir wall of Ennis.

"Prohibiting the use of drift nets in the tidal parts of River."

In River Maigue :—

"Prohibiting the use of draft nets between Ferry Drawbridge and the old bridge of Adare.

"Prohibiting use of all nets, except landing nets as auxiliary to rod and line, above Railway bridge below Adare.

"Prohibiting the use of drift nets.

"Prohibiting the shooting of fish."

In Lough Derg :—

"Permitting the use of nets not exceeding twelve yards in length, with meshes of one inch from knot to knot, for the capture of fish other than salmon and trout.

"Prohibiting the use of nets (except landing nets as auxiliary to angling with rod and line) for the capture of fish other than eels, between eight o'clock in the evening and six o'clock in the morning."

In River Deel or Askeaton :—

"Prohibiting the use of drift nets.

"Prohibiting the use of all nets (except landing nets as auxiliary to angling with rod and line) for the capture of salmon or trout in that part of the river situate between Broken Bridge and the mouth of River as defined."

The principal Rivers in the Limerick District, and their seasons for Netting and Angling for Salmon and Trout, are as follows :—

Rivers.	Tidal Netting.	Freshwater Netting, &c.	Angling, Single Rod and Line.
Cashen,	1st June to 31st August, inclusive,	Same as Tidal,	16th March to 31st Oct., inclusive.
Clohane,	1st April to 15th Sept., do.,	do.,	1st April to 30th Sept., do.
Deel or Askeaton,	Not allowed,	do.,	1st February to 30th Sept., do.
Doonbeg,	1st May to 15th Sept., do.,	do.,	1st May to 30th Sept., do.
Ennistimon or Lahinch,	Do. do.,	do.,	Do. do.
Fergus,	12th Feb. to 31st July, do.,	do.,	1st February to 30th Sept., do.
Maigue,	Do. do.,	do.,	20th February to 30th Sept., do.
Shannon,	Do. do.,	do.,	1st February to 30th Sept., do.

9, or Galway District,

Extends from Hag's Head, in the county Clare, to Slyne Head, in the county Galway, and includes all that part of the country the waters of which flow into the coast between those two points.

The take of fish has been less in 1878 than former year. Nothing could more clearly show the difficulty of accounting for the decreased capture of fish than this district. Here the fish may be seen, I may say, in thousands any day in summer when the water is sufficiently low. There are no disturbing influences such as exist in other places to diminish the supply. There are no fixed engines within 100 miles of the river. There is a large free gap in the fishing weirs in the river. The proprietors in the tidal waters expend a large sum of money annually on protection, and everything appears to be well managed. There appears to be a very large supply of fish in the upper waters, and, so far as I could learn, except in a few places, they are well protected, and yet, notwithstanding all, the supply fell short. It is said that fish are running later than usual, and that large quantities are seen ascending after the close season has commenced.

The angling was about equal to that of 1877, which was the best, save one year, for the past eighteen years.

It is very difficult to account for this falling off. I have always stated that there will be fluctuations in salmon fisheries no matter what care is bestowed on them; and I cannot have a better illustration of the correctness of this view than the rivers in this district.

The foregoing observations refer to almost every river in it, but there are in some rivers some additional reasons for increasing capture instead of a falling off, which I think well to mention.

In the Ballinahinch river, after a jubilee of two years free from netting, it was natur-

provisions of the Acts of 1863 and 1868 a nullity, and it becomes our duty to bring the subject now before your Grace.

In my former report I mentioned the very uncertain and unsatisfactory state of the law as regards fixed engines, and to the system allowed by the Board of Conservators of permitting them to be fished for several months without payment of license duty, and to which I beg now to refer.

During the season there were used in this district the following engines :—271 single salmon rods, 43 cross lines, 31 snap nets, 73 draft nets, 137 drift nets, 17 pole nets, 33 stake nets, 1 head weir, 9 boxes or cribs, 133 gaps or eyes for taking eels, producing a total revenue of £2,254 5*s.*, which, though appearing a large sum, is inadequate to the requirements of this large district.

There were 48 water bailiffs during the open, and about 105 during the close season employed by the Conservators, at wages ranging from 5*s.* to £1 per week. Only a few employed by private individuals, and these only to watch trespassers.

During the year there were 110 prosecutions by the Conservators, and 95 convictions obtained; by the Constabulary and others, with the assistance of the secretary of the Conservators, 29, of which 21 were convicted. Offences against the fishery laws appear not to have increased, while there is no perceptible diminution.

The close seasons in this district are—For tidal and fresh waters :—

"Between 31st July and 12th February, save rivers Cashen and Tributaries, and save between Kerry Head and Dunmore Head, and Loop Head and Hag's Head, and all rivers running into the sea between those points.

"For Cashen down to its mouth and Tributaries, between 31st August and 1st June; between Dunmore Head and Kerry Head, and all rivers flowing into the sea between those points, between 15th September and 1st April; between Loop Head and Hag's Head, and all rivers running into the sea between those points, between 15th September and 1st May."

For angling with single rods and lines :—

"Between 30th September and 1st February, save Cashen and Maigue rivers and their Tributaries; and save all rivers running into the sea between Loop Head and Hag's Head, and between Dunmore Head and Kerry Head. For Cashen and Tributaries, between 31st October and 16th March; for Maigue and Tributaries, between 30th September and 20th February; between Loop Head and Hag's Head, between 30th September and 1st March, and between Dunmore Head and Kerry Head, between 30th September and 1st April."

The bye-laws in force in the district are as follows :—

In River Shannon :—

"Prohibiting net fishing in that part of the River Shannon between Wellesley-bridge and the Railway bridge, between 1st June and 12th February.

"Prohibiting between the 1st day of August, or such other day as may be the first day of the close season, and the 1st day of November in each year, the use of draft nets, or any other net or nets used as a draft net, having a foot-rope and leads or weights affixed thereto, within the following limits, viz. :—In that part of the River Shannon situate between the Fishing weir known as the Lax Weir, and a line drawn due north and south across the said River Shannon at the western extremity of Graigue Island.

"Prohibiting draft nets for the capture of fish of any kind, of a mesh less than one and three-quarter inches from knot to knot, to be measured along the side of the square, or seven inches to be measured all round each such mesh, such measurements being taken in the clear when the net is wet, in the tidal parts of the River Shannon, or in the tidal parts of any of the rivers flowing into the said River Shannon.

"Prohibiting the fishing for salmon or trout by any means whatsoever, within a space of twenty yards from the weir wall of Tarmonbarry, on the River Shannon.

"Prohibiting having nets for capture of salmon or trout on board any cot or curragh between mouth of Shannon and Wellesley-bridge, in the city of Limerick, or in tidal parts of any rivers flowing into the said River Shannon between said points, between the hours of nine o'clock on Saturday morning and three o'clock on Monday morning; or between Wellesley-bridge and the Navigation Weir at Killaloe, in the county of Clare, between eight o'clock on Saturday morning and four o'clock on Monday morning.

"Prohibiting the shooting of fish in that part of River Shannon between Portumna-bridge and Shannon-bridge."

In River Shannon and Clonderlaw Bay :—

"Regulating the use of drift nets as follows :—

"First.—That no drift nets of greater length than 100 yards shall be used for the capture of salmon or trout in any part of the River Shannon between Limerick and a line drawn across the river below Askeaton, from Aughnish Point, in the county of Limerick, to Kildysart, in the county of Clare.

"Second.—That no drift nets of greater length than 200 yards shall be used for the capture of salmon or trout in any other tidal waters of the River Shannon, or in Clonderlaw Bay.

"Third.—That no two or more drift nets shall be attached together in any way or be allowed to drift within 150 yards of each other in the River Shannon, or in Clonderlaw Bay.

"Fourth.—That no drift nets below, or seaward of a line drawn across the River Shannon, from Aughnish Point, in the county of Limerick, to Kildysart, in the county of Clare, shall be used within the line of low-water mark of ordinary spring tides.

"Fifth.—That no drift nets shall be used in Clonderlaw Bay above a line drawn from Knock to Lacknabahee, in the county of Clare.

"That no drift nets shall be used in the Rivers Maigue or Askeaton."

In Lough Ree :—

"Permitting the use of nets, having a mesh of five inches in the round, measured when the net is wet."

In River Fergus :—

"Prohibiting the fishing for salmon or trout by any means whatsoever, within a space of twenty yards from the weir wall of Ennis.

"Prohibiting the use of drift nets in the tidal parts of River."

In River Maigue :—

"Prohibiting the use of draft nets between Ferry Drawbridge and the old bridge of Adare.

"Prohibiting use of all nets, except landing nets as auxiliary to rod and line, above Railway bridge below Adare.

"Prohibiting the use of drift nets.

"Prohibiting the shooting of fish."

In Lough Derg :—

"Permitting the use of nets not exceeding twelve yards in length, with meshes of one inch from knot to knot, for the capture of fish other than salmon and trout.

"Prohibiting the use of nets (except landing nets as auxiliary to angling with rod and line) for the capture of fish other than eels, between eight o'clock in the evening and six o'clock in the morning."

In River Deel or Askeaton :—

"Prohibiting the use of drift nets.

"Prohibiting the use of all nets (except landing nets as auxiliary to angling with rod and line) for the capture of salmon or trout in that part of the river situate between Broken Bridge and the mouth of River as defined."

The principal Rivers in the Limerick District, and their seasons for Netting and Angling for Salmon and Trout, are as follows :—

Rivers.	Tidal Netting.	Freshwater Netting, &c.	Angling, Single Rod and Line.
Cashen,	1st June to 31st August, inclusive,	Same as Tidal,	16th March to 31st Oct., inclusive.
Clohane,	1st April to 15th Sept., do.,	do.,	1st April to 30th Sept., do.
Deel or Askeaton,	Not allowed,	do.,	1st February to 30th Sept., do.
Doonbeg,	1st May to 15th Sept., do.,	do.,	1st May to 30th Sept., do.
Ennistimon or Lahinch,	Do. do.,	do.,	Do. do.
Fergus,	12th Feb. to 31st July, do.,	do.,	1st February to 30th Sept., do.
Maigue,	Do. do.,	do.,	20th February to 30th Sept., do.
Shannon,	Do. do.,	do.,	1st February to 30th Sept., do.

9, or Galway District,

Extends from Hag's Head, in the county Clare, to Slyne Head, in the county Galway, and includes all that part of the country the waters of which flow into the coast between those two points.

The take of fish has been less in 1878 than former year. Nothing could more clearly show the difficulty of accounting for the decreased capture of fish than this district. Here the fish may be seen, I may say, in thousands any day in summer when the water is sufficiently low. There are no disturbing influences such as exist in other places to diminish the supply. There are no fixed engines within 100 miles of the river. There is a large free gap in the fishing weirs in the river. The proprietors in the tidal waters expend a large sum of money annually on protection, and everything appears to be well managed. There appears to be a very large supply of fish in the upper waters, and, so far as I could learn, except in a few places, they are well protected, and yet, notwithstanding all, the supply fell short. It is said that fish are running later than usual, and that large quantities are seen ascending after the close season has commenced.

The angling was about equal to that of 1877, which was the best, save one year, for the past eighteen years.

It is very difficult to account for this falling off. I have always stated that there will be fluctuations in salmon fisheries no matter what care is bestowed on them; and I cannot have a better illustration of the correctness of this view than the rivers in this district.

The foregoing observations refer to almost every river in it, but there are in some rivers some additional reasons for increasing capture instead of a falling off, which I think well to mention.

In the Ballinahinch river, after a jubilee of two years free from netting, it was natur-

ally expected that there would have been an enormously increased quantity of fish in the third year, which would amply repay not only the commercial but the sporting interests. Netting was resumed last year, but not to the full extent, and I was informed it hardly paid its expenses, while the angling had not improved.

In the Screeb and other rivers no netting has been allowed for several years, and yet the angling was bad.

About 30 water-bailiffs employed by the Conservators in this district, half all the year round, the others from one to three months, at salaries of from £2 to £10. There are about 230 employed by private individuals, the majority of them by the lessees of the tidal fisheries.

The highest price obtained for salmon in this district during the year was 2*s.* 6*d.* per lb.; the lowest, 8*d.* There has been an increase in the size of the fish captured—the average weight of salmon being over 15 lbs., and that of peale or grilse over 6 lbs. There have been no cases of poisoning during the year, and offences against the fishery laws have diminished. There were 18 prosecutions by the Conservators, and two by the constabulary during the year—convictions in all the cases.

During the season the following engines were used in the district:—147 single salmon rods; 9 cross lines and rods; 12 draft nets; 6 trammel nets; 4 boxes or cribs; 21 gaps or eyes for taking eels; producing a revenue of £271.

The close seasons in force in the district are as follows:—

For tidal and upper waters:—

"Between 15th August and 1st February."

For angling with single rod and line:—

"Between 15th October and 1st February, save in Cashla, Doohulla, Spiddal, Ballinahinch, Crumlin, Screeb, and Inver rivers, which is between 31st October and 1st February."

The bye-laws in force are:—

In Galway River, and Loughs Corrib and Mask, and Tributaries:—

"Prohibiting the use of the instrument commonly called strokehawl or snatch, or any other such instrument.

"Prohibiting the use of nets of any kind whatsoever in any part of the rivers known as the Clare and Claregalway or Turloughmore rivers, in the county of Galway, above the junction of said rivers with Lough Corrib.

"Prohibiting the snatching or attempting to snatch salmon in any tidal or fresh waters in the district with any kind of fish hook covered in part or in whole with any matter or thing, or uncovered."

Rivers.	Tidal Netting.	Freshwater Netting, &c.	Angling with Single Rod and Line.
Ballinahinch,	1st Feb. to 15th August, inclusive,	Same as Tidal,	1st Feb. to 31st October, inclusive.
Cashla,	Do. do.,	do.,	Do. do.
Crumlin,	Do. do.,	do.,	Do. do.
Doohulla,	Do. do.,	do.,	Do. do.
Galway,	Do. do.,	do.,	1st Feb. to 15th October, do.
Inver,	Do. do.,	do.,	1st Feb. to 31st October, do.
Kilcolgan,	Do. do.,	do.,	1st Feb. to 15th October, do.
Spiddle,	Do. do.,	do.,	1st Feb. to 31st October, do.
Screeb,	Do. do.,	do.,	Do. do.

10', Ballynakill District,

Extends from Slyne Head, co. Galway, to Pidgeon Point, co. Mayo, and includes all that part of the country the waters of which flow into the coast between those two points.

The take of fish in this district during the past year has been also much less than in the preceding one. No reason can be assigned.

The amount of protection is much the same as former years. The quantity of breeding fish observed in the rivers is reported to be less than in preceding year. The spring salmon taken has increased in their average weight—average, 14 to 18 lbs.; that of peale, 5 to 7 lbs. They are nearly all exported.

Offences against the fishery laws have diminished. There were only 7 prosecutions by the Conservators during the year. Some of the proprietors employ private water-bailiffs, but only to a small extent. One proprietor subscribed £32 10*s.* towards protection.

The following engines were used in the district in 1878, viz.:—53 single salmon rods; 17 draft nets; 1 drift net; 2 pole nets; producing a total revenue of £111—a sum far short of the actually necessary requirements of the district.

There are no pollutions flowing into any of the rivers poisonous to fish.

The close seasons in force are as follows :—

In tidal and fresh waters :—

"Between 31st August and 16th February, save in Louisburgh and Carrownisky rivers and estuaries, which is between 15th September and 1st July."

For angling with single rod :—

"Between 31st October and 1st February, save in Louisburgh and Carrownisky rivers, which is between 31st October and 1st July."

There are no special by-laws in the district.

The principal rivers in the Ballinakill District, and the seasons for Netting and Angling for Salmon or Trout, are as follows :—

Rivers.	Tidal Netting.	Freshwater Netting.	Angling with Single Rod and Line.
Carrownisky, .	1st July to 15th Sept., inclusive, .	Same as Tidal, .	1st July to 31st October, inclusive.
Clifden, . .	16th Feb. to 31st Aug., do., .	do., .	1st Feb. to 31st October, do.
Delphi, . .	Do. do., .	do., .	Do. do.
Dawross or Kylemore, . .	Do. do., .	do., .	Do. do.
Erriff, . . .	Do. do., .	do., .	Do. do.
Louisburgh, . .	1st July to 15th Sept., do., .	do., .	1st July to 31st October, do.

10², or Bangor District,

Extends from Pidgeon Point, co. Mayo has to Benwee Head, and includes all that part of the country the waters of which flow into the coast between those two points.

In this district also the take of fish in 1878 has very much fallen off, and cannot be accounted for. It is reported that the same amount of protection has been afforded as in former years, but there have been no prosecutions by either the Conservators or the Constabulary, and offences against the fishery laws are diminished. From this district emanated the loudest complaints of poaching and lawlessness on the part of the country people. If such an improvement has taken place that there was during a whole year no necessity for prosecutions, a more prosperous state of things than that now reported as to the quantity of fish taken may be hopefully looked forward to.

The number of bailiffs employed by the Conservators was 75, and about 27 by private individuals, chiefly in the open season. No contributions towards the funds are received by the Conservators from any upper proprietors, but in some rivers the lessees of the tidal waters supplement the funds for the purpose of protection in the close season.

The appeal against the order altering the definition of the estuary of the Owenmore and Owenduff rivers was heard during the year, and allowed by the Judicial Committee of the Privy Council before which it came. As the merits of the question were not entered into, a further application has been received to alter the definition made by our predecessors, and it will form the subject of inquiry during the year.

The following engines were used in 1878 :—31 single salmon rods ; 25 draft nets, and 12 bag nets ; producing a revenue of £225.

The close seasons in the district are as follows :—

For tidal and fresh waters :—

"Between the 31st August and 16th February, save in Newport, Glenamoy, Burrishoole, and Owengarve Rivers and Estuaries ; for Newport River and Estuary, 31st August and 20th March ; for Glenamoy River and Estuary, 15th September and 1st May ; for Burrishoole and Owengarve and Estuaries 31st August and 16th February."

For angling with single rod and line :—

"Between 30th September and 1st May, save Burrishoole between 31st October and 1st February, Newport between 30th September and 1st May, Owengarve and Glenamoy between 31st October and 1st May, Owenmore and Munhim between 30th September and 1st February, Owenduff or Ballycroy, and Ballyveeny and Owenduff, and all rivers in Achill Island, between 31st October and 1st February."

The bye-laws in force in this district are as follows :—

"Prohibiting the removal of gravel or sand from any part of the bed of the Owenmore River, in the County of Mayo, where the spawning of Salmon or Trout may take place.

"Permitting the use of Nets with Meshes of one and a half inches from knot to knot (to be measured along the side of the square, or six inches to be measured all round each such Mesh, such measurements being taken in the clear, when the Net is wet), within so much of the said Rivers Owenduff or Ballycroy, Owenmore and Munhim, as lies above the mouth as defined, during so much of the months of June, July, and August, as do now or at any time may form part of the Open Season for the capture of Salmon or Trout with Nets, in the said Rivers."

The following are the principal Rivers in the Bangor District, with the Seasons for Netting and Angling for Salmon and Trout :—

Rivers.	Tidal Netting.	Fresh Netting.	Angling with Single Rod and Line.
Achill Island,	16th Feb. to 31st Aug., inclusive,	Same as Tidal,	1st Feb. to 31st October, inclusive.
Ballycroy,	Do. do.,	do.,	Do. do.
Burrishoole,	Do. do.,	do.,	Do. do.
Glenamoy,	1st May to 15th Sept., do.,	do.,	1st May to 31st October, do.
Moyour,	16th Feb. to 31st Aug., do.,	do.,	1st May to 30th Sept., do.
Munhim,	Do. do.,	do.,	1st Feb. to 30th Sept., do.
Newport,	20th March to 31st Aug., do.,	do.,	1st May to 30th Sept., do.
Owenmore,	16th Feb. to 31st Aug., do.,	do.,	1st Feb. to 30th Sept., do.
Owengarve,	Do. do.,	do.,	1st May to 31st October, do.

11, or Ballina District,

Extends from Benwee Head, in the county of Mayo, to Coonamore Point, in the county of Sligo, and includes all that part of the country the waters of which flow into the coast between those two points.

No district in Ireland is managed with more efficiency towards protection and the full development of the salmon fisheries than this district. Nearly £1,000 a year is annually expended on this alone, and the great bulk of this sum is contributed by the proprietors of the Tidal Fisheries of the River Moy, by whom I have been favoured with a return of the amount expended and the number of bailiffs employed by them since the year 1866 to the present date—which averages £827, and about 300 bailiffs annually. The proprietor of the fisheries in the Easkey River also expends a considerable sum in the protection of that river. The take of fish in the lower or tidal fisheries during 1878 was notwithstanding all this care much less than in 1877. The cause for this cannot be assigned.

It is alleged that the great number of drift nets in the bay, and the manner in which they are fished, has the effect of breaking the schools of fish and driving them out to sea. This does not exist in Galway where the fisheries are also well managed and where there was a like failure in the catch—so that it is hard to say if this allegation is correct. There is, however, one fact worth noticing that, since the great increase in the number of those engines fishing, the quantity of fish captured by the bag nets which are set on both sides of the bay has so fallen off that they are hardly worth fishing, for some years barely covering the expense. In former reports I alluded to the manner in which these drift nets were used in this bay and which I believed to be perfectly illegal. The tests therein referred to have since been applied, and through the kindness of the Captain commanding the guardship of the district we were enabled to have the assistance of two Coastguard Officers to carry out the experiment of remaining with their nets all night while fishing. It was stated by some of the people who use these nets, but who are not *bona fide* fishermen, that it would be impossible for them to do so without great danger and risk. We placed a Coastguard Officer in each of two of the fishing boats of the locality, with the ordinary fishing crew, and they were enabled to stop out at the fishing every night during the past season. They were each supplied with books to make a full report of everything and to keep observations, and their journals will aid us most materially in coming to some satisfactory settlement of this most vexed question.

I think it is only due to the officers who were lent to us for this service, which was a most onerous one, and against whom intimidations of rather a violent character were at first used, that they discharged it with energy, independence, great caution, and to the entire satisfaction of the Inspectors. The names of the officers to whom was entrusted this duty are—Mr. Richard G. Jagoe, Chief Boatman in charge Coastguard Station, Ballyvaughan, county Clare, and Mr. George M'Kinley, Chief Boatman in charge at Barna, county Galway—both of whom had on previous occasions carried out experiments relative to trawling in Galway Bay.

During the last fishing season it was determined that we should ourselves ascertain whether these nets were legally fished, or were, as had been frequently alleged, used as fixed nets by having heavy weights attached to them. The Captain commanding the guardship having very kindly placed at our disposal for the purpose, Her Majesty's Cutter *Victoria*, I proceeded therein to the bay quite unknown to the fishermen, and came in at night when only the nets are set, and felt it my duty to make, with the assistance of the cutter's men, several seizures of nets illegally fixed. All the parties were afterwards prosecuted to conviction, and their nets forfeited and sold. It was not at all unlikely that in performing this most unpleasant duty serious consequences

might have arisen amongst the fishermen who showed a determination at first to resist all authority, but for the judicious conduct and energy of Mr. James Coleman, the officer of the cutter, to whom was entrusted this duty and who discharged it fearlessly but temperately and to my entire satisfaction. The fishermen have all been cautioned against a repetition of these offences, and warned that similar steps will be taken next season to enforce the law. The Bye-Laws applied for regulating this mode of fishing will receive immediate consideration.

With the exception of the cases mentioned I do not know of any proprietor of fisheries in this important district, expending any money for the protection of the fisheries ; although in the river Moy, since the opening of the Free Gap in the fishing weir, valuable commercial fisheries have been created for the upper proprietors.

Before the Legislation of 1863 there was but one fishery in this river where netting was carried on. There are now in the distance of about 12 miles no fewer than 20 nets used, and the quantity of salmon taken last season in that space was one-third greater than that taken in the extensive tidal fisheries of the estuary and the bay. On this subject I beg to refer to former reports. So long as the upper proprietors had no, or very little interest in the fisheries by reason of the fishing weirs without a free gap barring the ascent of fish to their waters, except during the weekly close season, it could not be expected they would contribute towards the expense of protection. But since all this has been removed, and the fish have a free escape to the upper waters, where valuable properties, from which large revenues are derived since 1864, have been created, it was not too much to expect that funds would be contributed by the proprietors towards maintaining and increasing this property.

With the exception, however, of the License Duty, on the nets used, which it is imperative on the lessees of these fisheries to pay, I do not know a single instance where any assistance is afforded by the upper proprietors. All is left to the proprietors of the tidal fisheries who have so large an interest that they are forced, in defence of their property, to make great sacrifices to maintain it. Were the fisheries in the tidal waters public or divided amongst a number of proprietors as in the upper waters, the fisheries of the river would, without doubt, be most materially injured, and the public would eventually be the sufferers. I cannot think that such a course as I have pointed out is at all equitable.

There were 62 prosecutions by the Conservators during the year. Offences against the Fishery Laws have diminished.

Angling is prohibited in this district during the descent of the fry, so that little or no destruction takes place by it.

The following engines have been used in the district in 1878, viz. :—75 salmon rods, 40 draft nets, 51 drift nets, 5 bag nets, 7 boxes or cribs, and 13 eyes or gaps for taking eels, producing a revenue of £451, which would be completely inadequate for protection but for the large sums expended by the owners of the fisheries in the tidal waters.

For tidal waters the close seasons in force are :—Netting, between 12th August and 16th March, save Palmerston and Easkey Rivers, which is between 31st August and 1st June.

For upper waters—Netting, between 31st July and 1st February, save Palmerston and Easkey Rivers, which is between 31st August and 1st June. Angling—Between 15th September and 1st February, save Easkey river and tributaries, which is between 30th September and 1st June, and save Cloonaghmore or Palmerston River and tributaries ; the tidal parts being between 31st October and 1st February, and upper parts being between 31st October and 1st June.

The bye-laws in force are as follows :—

"Permitting use of nets with meshes of one and a quarter inches from knot to knot to be measured along the side of the square, or five inches to be measured all round each such mesh, such measurements being taken in the clear, when the net is wet.

"Prohibiting angling for trout during April and May in each year—Loughs Conn and Cullen excepted."

The principal rivers in the Ballina district and the seasons for netting and angling for salmon or trout are as follow :—

Rivers.	Tidal Netting.	Freshwater Netting.	Angling with Single Rod and Line.
Ballycastle, . .	16th Mar. to 12th Aug., inclusive.	1 Feb. & 31 July	1st Feb. to 15th Sept. inclusive.
Cloonaghmore or Palmerston,	1st June to 31st Aug. do. .	Same as Tidal, .	In tidal water, 1st Feb. to 31st Oct., and in up waters, 1st June to 31st Oct. inclusive.
Easkey, . . .	1st June to 31st Aug. do. .	do.	1st June to 30th Sept. inclusive.
Moy, ...	16th Mar. to 12th Aug. do. .	1 Feb. & 31 July	1st Feb. to 15th Sept. inclusive.

12, or Sligo District,

Extends from Coonamore Point, County Sligo, to Mullaghmore Point, and includes that part of the country the waters of which flow into the coast between those two points.

The general state of the salmon fisheries in the district is reported as favourable, though the take of summer fish or grilse was less than in preceding year. The take of salmon was about the same. The spring fish is getting larger every year; they average now about 13 lbs. The amount of protection by the Conservators was about the same as former years. The Bailiffs heretofore employed by the Proprietors of the Tidal Fisheries were not, it is reported, re-appointed during the last season. This is stated to be in consequence of the alteration in the open season, which cut off 15 days of their early and best fishing, viz. :—from the 1st to the 15th January inclusive.

Whether the angling has improved in consequence I could not obtain any authentic information.

The quantity of breeding fish has increased. It is reported that offences against the Fishery Laws are about the same as former years. However there were no prosecutions during the year by the Conservators.

The engines used during the year were :—14 salmon rods; 1 cross line; 19 draft nets; 1 bag net; 5 gap or eyes for eels; producing a revenue of £87, which is wholly inadequate for the necessary protection.

The close seasons in force are—for tidal waters—

"Between 19th August and 4th February, save Sligo river and Estuary, which is between 31st July and 16th January."

For fresh waters—

"Between 19th August and 4th February, save Sligo river which is between 31st July and 16th January."

For angling with single rod—

"Between 30th September and 1st February, save in Drumcliffe river and Glencar lake between 19th October and 1st February."

The bye-laws in force are as follows :—

"Prohibiting the snatching, or attempting to snatch, salmon in Sligo river with any kind of fish-hook, covered in part or in whole, or uncovered.

"Permitting use of nets with meshes of half an inch from knot to knot, for capture of fish."

The principal rivers in the Sligo district and the seasons for netting and angling for salmon or trout are as follows :—

Rivers.	Tidal Netting.	Freshwater Netting.	Angling with Single Rod and Line.
Ballisodare,	4th Feb. to 19th Aug. inclusive,	Same as Tidal,	1st Feb. to 30th Sept. inclusive.
Drumcliffe,	do.	do.	1st Feb. to 19th Oct. do.
Grange,	do.	do.	1st Feb. to 30th Sept. do.
Sligo,	16th Jan. to 31st July inclusive,	do.	do. do.

In conclusion I have only to say that although the Salmon Fisheries of Ireland on the whole, during the past year, have partly partaken of the general decline in capture which occurred in other countries, I believe them to be in a satisfactory condition, but that there will always occur a fluctuation in the produce over which man has, up to the present, no control, or little knowledge to prevent, I have no doubt.

The Coastguard and Constabulary have been most active as a general rule in giving assistance in the enforcement of the laws, and I have invariably found from both services the most cordial assistance, cheerfully and earnestly given, whenever required.

THOMAS F. BRADY.

MAJOR HAYES' REPORT.

Division extending from Slea Head in the County of Kerry in the west to Wicklow Head in the east, and including eight fishery districts—viz., No. 7, Killarney; No. 6^2, Kenmare; No. 6^3, Bantry; No. 6^1, Skibbereen; No. 5, Cork; No. 4, Lismore; No. 3, Waterford; and No. 2, Wexford, which embrace the whole or portions of the following counties, viz.:—Kerry, Cork, Waterford, Tipperary, Limerick, Kilkenny, Carlow, Wexford, Queen's County, King's County, Kildare, and Wicklow.

No. 7. Killarney District.

Extending from Lamb Head to Dunmore Head, both in the county of Kerry.

The capture of salmon in this district was considerably below that of 1877. The season commenced well, and gave promise of being very abundant, but as the Summer advanced it fell off, and resulted unsatisfactorily.

The continued severe frosts, commencing in November, prevented the fish in the spawning season finding their way into the smaller streams, and it is reported that the quantity of breeding fish seen was less than in the previous year.

The average size of the salmon and peale has increased considerably.

In 1876 salmon averaged 10 lbs. weight.
„ peale „ 5 „
In 1878 salmon „ 12 „
„ peale „ 6 „

Preservation is looked after in this district by private owners of fisheries more vigorously than in most others. In addition to 80 Water Bailiffs employed by the Board of Conservators, some 40 are employed by individual proprietors.

It is gratifying to find that no cases of poisoning rivers occurred during the year, a very unusual fact in this District.

Offences against the Fishery Laws about the same in 1878 as in 1877.

There were 48 prosecutions, resulting in 32 convictions, and 16 cases in which the summonses were dismissed. Of the 32 convictions 4 were subsequently reversed on appeal to Quarter Sessions, it is believed in consequence of the summonses not having been taken out under proper sections of the Acts of Parliament.

The table of close seasons and the Bye-laws in force in this district will be found at pp. 65 and 68.

The following engines were licensed in this district in 1878:—102 salmon rods, 4 cross lines, 64 draft nets, 2 boxes or cribs, producing with the amount received upon the percentage on Poor Law Valuation and fines inflicted, a total of £403 1*s.* available for protection, as against £405 5*s.* for the year 1877.

I do not regard the unsatisfactory season of 1878 as an indication of decline in the fisheries of this district, but rather as the result of an exceptionally unsuitable condition of weather during the fishing season.

No. 6^3. Kenmare District.

Extending from Crow Head to Lamb Head, in the county of Kerry.

The reports received from the Kenmare district for 1878 are satisfactory. It is officially reported that the sweeper nets captured more fish than in the preceding year.

In this as in the Killarney district individual proprietors do much to secure proper preservation, by employing Water Bailiffs at their own expense, independently of those paid out of public funds by the Conservators.

The state of the spawning beds in regard to the stock of fish seen upon them in the season, was very satisfactory.

No observable change in the size of the fish has been remarked.

Offences against the Fishery Laws are reported as having diminished considerably, and there was only one instance of poisoning during the year—this was on the Roughty River.

In consequence of an application that we should inquire into the system of netting with sweep nets carried on in the Kenmare Estuary, and the allegation that the system pursued was detrimental to the fisheries, the Inspectors issued notices that a public meeting would be held to inquire into the subjects at Kenmare, on the 18th October last.

The inquiry was held, and evidence taken on the subject, the result of which was

that, in the interest of the fisheries, we deemed it necessary to make a Bye-law containing the following clauses :—

"1. It is prohibited, and it is hereby prohibited to use any Net for the capture of salmon or trout in any part of the said Kenmare River or Bay of greater length than One Hundred and Thirty Yards.

"2. It is prohibited, and it is hereby prohibited to beat the water or to throw stones or other missiles therein during the time of shooting or drafting Nets for the capture of salmon or trout in the said Kenmare River or Bay.

"Each and every person offending against any of these Bye-Laws, Rules, and Regulations, shall forfeit and pay for each offence a sum of FIVE POUNDS, and every Net used contrary hereto shall be forfeited."

The Bye-law is now progressing through the different stages required by Act of Parliament. When these are completed it will be submitted to Your Grace and Privy Council for approval.

It is believed that this Bye-law will have a very beneficial effect upon the fisheries of the Kenmare District.

The engines licensed and used in 1878 were 22 single rods, 7 draft nets, 5 sweepers and 1 bag net, producing altogether £57 10*s.*, which, with £6, the per-centage on Poor Law Valuation, amounted to £63 10*s.*, as compared with £76 5*s.* available for protection.

For table of close seasons see page 68 of Appendix.

Mr. Mahony, of Dromore Castle, still continues his operations in artificial propagation of salmon, and there is little doubt but his efforts have done much to secure the stock of fish being kept up as it has hitherto been.

No. 6². BANTRY DISTRICT.

Extending from Mizen Head to Crow Head, in the county of Cork.

It is reported that the capture of salmon in 1878 was less than in the preceding year.

The stock of fish, however, on the spawning beds was greater.

The average size of the fish about the same as last year.

Only two offences against the Fishery Laws were the subject of prosecution ; in both cases the parties were convicted.

The Bye-laws affecting this district will be found at page 65 of Appendix, and the close season table at page 68.

Licensed engines in use in 1878—13 salmon rods and 12 draft nets, which, with amount received for fines, &c., produced a revenue available for protection of £53 13*s.* 7*d.*, as compared with £48 in 1877.

No. 6¹. SKIBBEREEN DISTRICT.

Extending from Galley Head to Mizen Head in the County of Cork.

The report of the produce of this district is again unsatisfactory—the report being that the capture was much less in 1878 than in 1877.

The stock of fish on the spawning beds is also reported as less.

In last year's Report it was stated that, "in consequence of applications from the Board of Conservators of the district, inquiries will be held, as soon as other engagements will permit, into the different subjects of complaint, &c."

In conformity with the foregoing a public meeting was held at Skibbereen, on the 9th May last, and the following subjects were inquired into :—

1. As to close seasons.
2. Definition of mouths of rivers.
3. Prohibition of drift nets.
4. To repeal Bye-law permitting the capture of salmon by nets with meshes of one inch from knot to knot.

The inquiries resulted in our making the following changes :—

1. As regards close season—

For nets and all other engines in Tidal Waters, save single rods and lines—Close season to commence on 15th September instead of 30th, and to end on 1st May.

Fresh Waters—To commence on 1st August instead of 30th September, and end on 1st May.

No change *in season* for single rods and lines.

2. As to definition of mouths of rivers—

After careful inquiry we considered it necessary to re-define the mouth of the principal river in the district, the Ilen, as shown upon a map attached to the order, and which is now awaiting the approval of Your Grace and Privy Council.

With regard to the other rivers in the district, we came to the conclusion that no change was necessary.

3. As to drift nets—

The decision at which we arrived was, that drift nets, fished in such narrow waters as those in this district, were most injurious.

A Bye-law prohibiting their use was accordingly prepared, and this is also awaiting approval.

4. On the subject of repealing the Bye-laws permitting the use of small-mesh nets—

The question was deferred for another year, as it was considered that the Bye-law should have further trial, before any decision could properly be arrived at, with regard to the necessity for repealing it.

For Bye-laws and Close season tables see pp. 65 and 68 of appendix.

The following engines were licensed in 1878—15 draft nets and 11 single rods, producing together £56, which, with £2 14*s.* received on account of fines for offences against the Fishery Laws, amounted to £58 14*s.*, available for protection, as against £62 14*s.* 4*d.* in 1877.

No. 5. Cork District

Extending from Ballycotton Head to Galley Head, both in the county of Cork.

I am again in a position to report favourably of this district, both net and rod fishings having been most prosperous, and the capture much greater in 1878 than in the previous year.

For several years this improvement has been steadily going on, and is mainly due to the great interest taken in the fisheries by the Board of Conservators, and also to the action of the Cork Anglers' Club, which is still pursuing its steady course of usefulness, in aiding in the preservation of the rivers.

The Bye-laws which I referred to in my last report, prohibiting the use of drift nets in the River Lee and estuary, and prohibiting the keeping of salmon nets on board boats during the weekly close time, have been found most salutary ; and there can be no doubt have tended to the improvement of the fisheries ; but it is exceedingly difficult to devise measures which will prove thoroughly effective in putting down poaching, where the habit has been long established, and when it is attended with considerable profit.

Thus in the case of the Bye-law prohibiting the use of drift nets in the Lee and Estuary, it was found that some of the owners of these nets have since had them licensed as draft nets, using them openly as such, but at night and when not closely watched by the Bailiffs some were fished in the ordinary way as drift nets. The result was that in the early part of the season a great proportion of the fish taken was captured by the drifts. This was clearly seen, from the marks upon the fish when exhibited for sale in the markets.

A further inquiry was in consequence held into the matter, and it was shown to our satisfaction that the only way to meet the difficulty was to make a Bye-law regulating the maximum size of the meshes of nets to be used for the capture of salmon in the River Lee.

This was accordingly done, and the following bye-law was prepared, and having been since approved by Your Grace and the Privy Council of Ireland, it is now in force. The maximum limit of mesh to ten inches, it is believed, will secure that the nets used will practically be useless as drift nets, as few salmon can mesh in them :—

"Whereas the practice of using nets, having meshes of greater dimensions than two and one-half inches from knot to knot, or ten inches in the round, in any tidal waters in that part of the district heretofore defined and known as No. 5, or "The Cork District," situated inside or to the northward of a straight line drawn in the direction of Templebreedy Church, from the Lighthouse at Roche's Point on the east, to the Mainland on the west, all in the county of Cork, is in our opinion detrimental to the fisheries of the said district, and it seems to Us, the Inspectors of Irish Fisheries, to be expedient for the more effectual government, management, protection, and improvement of the salmon and trout fisheries in the said district, to prohibit such practice, and to impose and prescribe conditions and restrictions as to the size of the meshes thereof ; Now, We, the said Inspectors, acting under the powers and authorities given to us, do make and ordain this Bye-law, by which it is prohibited, and it is hereby prohibited to use any net for the capture of salmon or trout in any part of the aforesaid tidal waters of said district having meshes of greater dimensions than two and one-half inches from knot to knot, to be measured along the side of the square, or ten inches to be measured all round each such mesh, such measurements being taken in the clear when the net is wet.

"Each and every person offending against this Bye-law shall forfeit and pay for each offence a sum of Five Pounds, and every net having meshes of greater dimensions than aforesaid, and found in any of the places in which it is hereby prohibited to use such net, shall be forfeited."

The stock of fish on the spawning grounds is reported as greater than in 1877.

The average size of salmon, 12 to 14 lbs.

The rod fishings are steadily and largely increasing in value, and the success attending the rod fishers has been very gratifying—from four or five, to ten or twelve salmon, having been not an out-of-the-way capture in a single day to one rod.

Had this desirable result been obtained by any sacrifice of the net fishery interests, it would not have been satisfactory, but this has not been so. The nets also have been most successful, and have contributed a considerably increased supply of fish to the markets.

For Close season tables and the Bye-laws in force in the district, see pp. 64, 65, and 68 of Appendix.

With the approval of the authorities a gunboat was again stationed on the Lee to aid in preservation during the past Close season. Her services were most valuable, a number of nets illegally fishing having been seized by her crew

Offences against the Fishery Laws are reported as having diminished.

Fifty-one cases of prosecution occurred. Of these, the parties in forty were convicted and fined, and eleven were dismissed.

The following engines were licensed and fished during the season 1878 :—283 single rods, 3 cross lines, 73 draft nets, 4 drift nets, 1 bag net, 1 stake net, producing altogether a sum of £560 available for protection.

The fisheries of the Cork district have improved during the last six or seven years to a greater extent than any other in Ireland, and although, as the quantity of fish increases, the temptation to poachers is also greater, it is to be hoped that the exertions of the Conservators and proprietors of fisheries to improve these rivers, which have hitherto been so successful, will not be relaxed in the future. The same constant watchfulness which has of late years prevailed, will be necessary, if the improvement is to be maintained.

No. 4. Lismore District.

Extending from Ballycotton, in the County of Cork, to Helvick Head, in the County of Waterford.

As in many other districts, the capture of salmon in this was less in 1878 than in the previous year, in consequence of the exceptional weather which prevailed during a part of the fishing season.

The quantity of fish on the spawning beds has increased.

Offences against the Fishery Laws are reported to have diminished, although in consequence, it is presumed, of increased vigilance, the number of prosecutions was greater than in 1877.

Ninety-two persons were prosecuted for offences of various kinds against the Fishery Laws, of these 39 were at the instance of the Board of Conservators, and 53 by the Constabulary and Coast Guard, of the former 35 were convicted, and 4 were acquitted or dismissed, and of the latter 43 were convicted and 10 were acquitted or dismissed.

In my report for last year I referred to our proposed action, with a view of somewhat restricting the operation of the drift-net fishing which we were quite satisfied, as previously carried on, had injured the fisheries of the river. Accordingly the following Bye-Law was prepared by us, and, having been approved by Your Grace and Privy Council, is now in force.

"We, the Inspectors of Irish Fisheries, acting under the authority of the above-named Acts, do make and ordain this Bye-law, by which it is prohibited, and it is hereby prohibited, to use for the capture of salmon or trout any drift net in the tidal portion of the River Blackwater, or its tributaries, above or to the northward of a line drawn across said river from the townland boundary between the townlands of Strancally and Newport East on the west, to the townland boundary between the townlands of Coolbagh and Ballynaclash on the east, all in the County of Waterford. Any person offending against this Bye-law shall forfeit and pay for each offence a sum of Five Pounds, and all nets used contrary to this Bye-law shall be forfeited."

I am quite satisfied that this Bye-law will have a marked effect in increasing the productiveness of the district. Drift fishing in comparatively open water may, under certain restrictions be permitted, but on the narrow reaches of the river from which it will now be excluded, it was most injurious.

For Close season tables and Bye-laws in force, see pages 64 and 68 of the appendix.

In 1878 the following engines were licensed and used for taking salmon :—253 single rods, 6 cross lines, 25 snap nets, 11 draft nets, 106 drift nets, 1 pole net, 1 bay net, 2 stake weirs, 2 boxes or cribs, producing a sum of £745 10*s*. In addition to this £57 10*s*. 7*d*.

was received for fines, £5 10*s.* from the sale of forfeited engines, and £68 per-centage upon the Poor Law Valuation of Fisheries. The whole amounting to £876 10*s.* 7*d.* available for protection.

Although since 1868 the funds of the District have considerably increased, yet they are still totally insufficient to provide such protection as would secure the proper developement of the fisheries. This may easily be inferred by a reference to the Ordnance Survey Catchment Basin Map, which shows that the principal river, the Blackwater, has a length of 104 miles, with tributaries of 234, besides minor streams in which salmon deposit their ova, and two other rivers respectively 13¼ and 9 miles in length.

The present Clerk of the District, a most intelligent and energetic officer, recently gave us sworn evidence that the district was not properly watched, and that he considered it would require over £2,000 a year to secure proper protection, or nearly three times the sum available.

In this evidence, from my own experience, I fully concur.

At the conclusion of the Public Inquiry which we held in the Court House, Fermoy, on the 11th March last upon the drift net question, complaints were officially made to us as to the illegal condition of the Lismore Fishing Weir. In reply we intimated that the subject would be looked into, and that we would take such steps in regard to it as we might deem to be necessary.

Subsequently we made a full statement of the case to the authorities and requested sanction for the employment of a solicitor to enable us to bring the matter in proper legal form before the Magistrates at Petty Sessions, but the authority has not been granted.

The condition of this weir has long been a subject of complaint, and we have before now officially communicated with the agent of the proprietor, informing him that we considered that the "Free Gap in the Weir is not in conformity with the provisions of the Act 26 and 27 Vic., chapter 114."

For a considerable period the Conservators carried on legal proceedings to compel the owner to have the Gap placed in accordance with the law. They failed upon a point of law, and they will not now move further in the matter, as they consider the question should be taken up by this department.

There is no doubt that the funds of the district are insufficient to provide for legal expenses, and although it may be argued that individual proprietors should take up matters of this kind, none will come forward to do so, in order to settle a question which applies generally to all Ireland, and thus the provisions of the Act of 1863 become a dead letter.

Feeling that the question was a public one, and demanded our attention, we made the representation to which I have before referred.

No. 5—Waterford District.

Extending from Helvick Head, in the County of Waterford, to Kiln Bay (East of Bannon Bay), in the County of Wexford.

The condition of the Fisheries in 1878 I consider to have been as satisfactory as could be expected considering the peculiarities of the season.

In the early season the take of fish far exceeded the quantity taken in the corresponding period of 1877—say for the first three months :—the falling off from that period was very considerable, and can only be accounted for by the peculiarities of the season.

In my last report I referred to the dissatisfaction of the Conservators of the Upper Tidal Waters of the Rivers Nore and Barrow, who complained that the quantity of fish reaching the upper waters was decreasing, and that this decrease was caused by the increase of drift-nets on the lower Fisheries.

The inquiries held in 1877, and concluded in 1878, led to the following Bye-Law being prepared. I am very glad to say that having been since submitted to Your Grace and Privy Council, and having been approved, it is now in force :—

"We, the Inspectors of Irish Fisheries, acting under the authority of the above-named Acts, do make and ordain this Bye-Law, by which it is prohibited, and it is hereby prohibited, to use for the capture of Salmon or Trout any Drift Net in the Tidal portions of the River Suir, Nore, and Barrow, above a line drawn across said River from Cheekpoint, County Waterford, on the west, in an easterly direction to Canpile Pill, in the County of Wexford. Any person offending against this Bye-Law shall forfeit and pay for each offence a sum of Five Pounds, and all Nets used contrary to this Bye-Law shall be forfeited."

The following extract from our report to the Privy Council, which accompanied the

bye-law, will be interesting as showing the rapid increase of this description of engine fishing in the Waterford Estuary :—

2. "Before the Act of 1863, the number of drift nets used in these rivers in any year only amounted to 28; since then it has increased to 90, and in 1877 there were 77 of these nets used :—

"For the 13 years before the Act of 1863, up to the end of 1876, the average number of drift nets used was 20
For the 13 years since that Act the average number was 78
For the 7 years before the Act of 1863, the number was 26
For the 7 years after the Act of 1863, the number was 78
For the first 6 years during which there is any official record of the number used, viz., 1851 to 1856, the average number was 13

3. "Formerly, before the Act of 1863, these nets were used mainly seaward of the line proposed in our Bye-law, and never, except very occasionally, in the narrow parts of the rivers above this proposed line."

At the appeal which was argued before the Judicial Committee of the Privy Council against the bye-law, exhaustive evidence was taken with regard to it, and every argument was used to prevent its passing; but after mature deliberation, the Committee recommended that it should be sanctioned.

The rod fishings in the Suir are steadily increasing in value.

The average size of salmon is reported to have increased; they now average 14 lbs.

During 1878 there were 82 prosecutions for violations of the Fishery Laws before the magistrates at Petty Sessions, of these 79 resulted in convictions, and the offenders fined; the remaining three were acquitted.

For tables of Close seasons and the Bye-laws in force, see pp. 64 and 68 of Appendix.

The following engines for taking salmon were licensed and used in 1878;—216 salmon rods, 14 cross lines, 244 snap nets, 29 draft nets, 90 drift nets, 4 stake weirs, 3 boxes or cribs, and 22 gaps or eyes for eels. The amount received for License duty being £1,141. To this must be added £103 1*s.* 11*d.* received on account of fines, £3 9*s.* 4*d.* for the sale of forfeited engines, and £11 10*s.* 7*d.* interest on Bank deposits, making altogether a sum of £1,259 1*s.* 10*d.* available for protection, as compared with £1,173 11*s.* 4*d.* received for the previous year.

No. 2.—Wexford District.

Extending from Wicklow Head in the County of Wicklow to Kiln Bay (east of Bannow Bay), in the County of Wexford.

Although the fisheries in the district are reported to be "improving," yet the capture of salmon was less in 1878 than in 1877.

The number of fish on the spawning beds was greater than preceding year.

The size of the salmon taken is reported to be considerably larger than in previous years. The peale has not increased in size.

Offences against the Fishery Laws have decreased.

During the year 31 persons were summoned for offences against the Fishery Act; 29 of these prosecutions ended in convictions against the different persons; the remaining two were dismissed.

The close season tables and the bye-laws in force in this district will be seen at pages 64 and 68.

The following engines were licensed for fishing :—83 salmon rods, and 54 draft nets, producing, with £39 4*s.* 5*d.* received for fines, a sum of £284 4*s.* 5*d.*, available for protection as against £252 14*s.* 6*d.* received in 1877.

Concluding Observations.

The year of 1878 was not generally as productive as that of the previous year, but on the whole it may be considered about an average season.

The spring fishing commenced well, and gave promise of a most productive year, but as the season advanced the take of fish diminished, and the results not as satisfactory as were anticipated.

The rainfall for March and April in 1878 was much below that for 1877, viz. :—

	1877.	1878.
March,	2·576	1·159
April,	3·861	2·360

whilst in May and June this order was reversed, thus—

	1877.	1878.
May,	2·155	4·192
June,	1·087	5·389

In the earlier part of the season the nets in the lower fisheries were most effective, whilst later on the great quantity of water in the tidal parts of the rivers prevented their efficient working, but after all it is not easy to decide positively the cause of the diminished capture.

I have so often commented upon the fact, that in but few cases the amounts due to the district, upon the valuation of the different fisheries have been paid, that it appears almost useless again to draw attention to it. It is most important that this source of revenue should be closely looked after, and I must say, that I consider the avoidance of this very proper tax, reflects little credit upon owners of fisheries, who in many cases derive considerable incomes from them without any expenditure, beyond the payment of their ordinary license duty.

I have but litttle to add, further than to reiterate in the strongest manner my opinion, as expressed in former reports, of the necessity of revising the scale of license duties, and the result to be expected therefrom.

The Royal Irish Constabulary have rendered invaluable assistance in preservation during the close season, especially in the counties of Cork and Waterford, and I quite anticipate their good work will be shown by increased production in the future. The Coast Guard also have rendered good service in many ways.

Altogether I consider the fisheries of my division in a satisfactory condition.

JOS. HAYES.

MR. JOHNSTON'S REPORT.

Division extends from Wicklow Head to Mullaghmore, County Sligo, embracing in whole or part the Counties of Wicklow, Dublin, Kildare, King's County, Meath, Westmeath, Louth, Cavan, Longford, Monaghan, Down, Armagh, Antrim, Londonderry, Fermanagh, Tyrone, Donegal, Leitrim, and Sligo, and includes the eight Districts of Dublin, Drogheda, Dundalk, Ballycastle, Coleraine, Londonderry, Letterkenny, and Ballyshannon.

No. 1, or Dublin District

Extends from Wicklow Head to Skerries, county Dublin, embracing in part or whole the counties of Wicklow, Dublin, Kildare, and Meath.

Close Seasons.

Tidal Waters—From Howth to Dalkey Island—Between 15th August and 1st of February. For remainder of district—Between 15th September and 2nd March.

Fresh Water—Same. Angling with cross lines—Same. Angling with single rod and line—Between 31st October and 1st February.

Bye-Laws.—River Liffey.

Prohibiting the catching or attempting to catch salmon with any net of greater length than 350 yards between Island-bridge weir and a line drawn due north from Poolbeg Lighthouse.

Permitting the use of nets with meshes of one inch from knot to knot for the capture of salmon or trout between Dalkey Island and Wicklow Head.

Report.

The general state of the salmon fisheries in this district during 1878 has been prosperous.

There has, however, been a falling off in the number of engines used in this district as compared with 1877, in which year there were in use 109 salmon rods, 2 cross lines, and 14 draft nets. In 1878 the numbers were 97 salmon rods, 1 cross line, and 16 draft nets.

Consequently the receipts have fallen off. The amount taken for salmon rods being £97; for cross line, £2; and for draft nets, £48—making, with £4 4*s.* 10*d.* for fines—a total of £151 4*s.* 10*d.*, as compared with £159 13*s.* 8*d.* in 1877.

The average weight of salmon taken was 10½ lbs.; that of peale 4 lbs.

The highest price given for salmon was 3*s.* 6*d.*; the lowest, 8*d.*; average, 1*s.* 6*d.* per lb.

The take of salmon and grilse in this district was about the same as in 1877, when it was fully double that of the preceding year.

There are no water bailiffs employed by the Board; but the Conservators allow the Swords Angling Club £10 per annum towards the protection of the Swords River. The Clerk of the Conservators acts as inspector of the district.

There are, however, six water bailiffs employed by private individuals—three by the Earl of Meath, one by Mr. R. Cane, of Celbridge, and two by the Swords Angling Club.

Great numbers of salmon have been destroyed in dry weather at the mouth of the Liffey, in consequence of the discharge of poisonous matter into the tideway of the river by the chemical works on the north and south quays.

There have been five successful prosecutions for breaches of the fishery laws during the year on the part of the Constabulary, with whom the Conservators co-operated, although not themselves prosecuting any persons. The value of the services of the Constabulary is, therefore, apparent, and it is hoped that they will still further endeavour to prevent the destruction of fry, which takes place on such portion of the rivers as are open to the public, where, under pretence of angling for trout, perch, and pike, the fry, in their descent to the sea, are killed in considerable numbers.

No. 17[1], or Drogheda District

Extends from Skerries, county Dublin, to Clogher Head, county Louth, and embraces portions of the counties of Dublin, Louth, King's County, Meath, Westmeath, and Cavan.

Close Seasons.

For all Engines—Between 4th August and 12th February.

No Bye-Laws.

Report.

The general state of the salmon fisheries in this district, in 1878, has been satisfactory. On the whole, there has been a considerable increase in the number of engines used in the district over 1877. There were, in 1878, in use—66 salmon rods, 5 cross lines, 6 snap nets, 61 draft nets, 5 boxes, and 44 eel nets.

The receipts have considerably increased since last year. They were, for salmon rods, £66; for cross lines, £10; for snap nets, £9; for draft nets, £183; for boxes, £50; and for eel nets £44; making, with £1 6*s.* 8*d.* for fines, a total of £363 6*s.* 8*d.*, as compared with £322 17*s.* 1*d.* in 1877.

The average weight of salmon taken was 16 lbs.; of peale, 5 lbs.

The highest price given for salmon was 2*s.* 6*d.*; the lowest, 7*d.*; average, 1*s.* per lb.

Large captures of salmon were made in the spring, especially in tidal waters; but the summer fishing was below the average of former years. Grilse did not begin to run in any quantity till at and after the close of the season.

The stock of breeding fish continues to increase. The spawning beds have been every where fully occupied.

Fifteen water-bailiffs are employed by the Conservators, and one by Mr. J. L. W. Naper and others.

In one or two places there has been destruction of the fry, but that of spent fish has much diminished.

The number of persons prosecuted to conviction by the Conservators was eight; while sixteen were prosecuted to conviction by the Constabulary. The principal portion of the prosecutions in the former case was for fishing during the weekly close season; while the destruction of fish by flax-water flowing into rivers was watched over by the Constabulary.

No. 17[2], or Dundalk District

Extends from Clogher Head, county Louth, to Donaghadee, county Down, embracing, in whole or part, the counties of Louth, Meath, Down, Armagh, Monaghan, and Cavan.

Close Seasons.

For tidal and fresh waters, save in Annagassan, Glyde, Dee, Fane, and their tributaries —Between 31st August and 1st April. In Glyde, Dee, and Annagassan—Between 19th August and 12th February. Fane River—Between 19th August and 1st April.

Angling with cross lines—Same as netting. Angling with single rod—11th October to 1st of March, save in Annagassan, Glyde, and Dee. In Annagassan, Glyde, and Dee—Between 30th September and 1st of February.

Bye-Laws.

Prohibiting to catch, or attempting to catch, salmon or trout with any net of greater length than 500 yards between Clogher Head and Ballagan Point, county Louth.

Prohibiting the catching, or attempting to catch, salmon in any tidal water between Dunany Point and Soldiers' Point, county Louth, with a spear, lyster, otter, strokehaul, dree-draw, or gaff, except when the latter is used as an auxiliary with rod and line, or for removing fish from any legal weir or box by the owner or occupier thereof.

Report.

The general state of the salmon fisheries in this district during 1878 was satisfactory, a continued improvement having taken place.

There has been an increase in the number of engines used in the district as compared with 1877; the number in 1878 being 47 salmon rods (two more than in any other year since the district was formed), 25 draft nets, 2 bag nets, 1 head weir, and 35 eel nets.

The receipts have also very largely increased this year. They were, for salmon rods, £47; for draft nets, £75; for bag nets, £20; for a head weir, £6; for eel nets, £35.

The amount received from fines was £42 15*s.* 6*d.*; rates on Poor Law valuation of several fisheries, £8; subscription received, £5 10*s.* The total receipts amounted to £239 5*s.* 6*d.*, as compared with £187 10*s.* 8*d.* in 1877.

The average weight of the salmon taken was 15 lbs.; that of peale 8 lbs. This shows a considerable increase over 1877.

The take of salmon and grilse in the district was more productive than in 1877, which is attributable to the high floods in May and June.

The highest price given for salmon was 2*s.* per lb.; the lowest, 1*s.*; average, 1*s.* 6*d.* per lb.

The quantity of breeding fish observed in the rivers was much greater than in 1877, in which year it was considerably over that of 1876.

Twenty-six water bailiffs are employed by the Conservators, for various periods of time, from one to four months, in one case for the whole year. There is, also, an Inspector of Water-Bailiffs employed for ten months.

Twenty-six prosecutions were instituted by the Conservators. In eight of these the cases were dismissed, while four were reversed on appeal.

Thirty prosecutions were instituted by the Constabulary, whose activity and energy in this district, in enforcing the fishery laws, deserve praise.

There is a great deal of unlicensed fishing in certain parts of the district, notwithstanding the vigilance of the Clerk to the Conservators and of the Constabulary. The Board have taken all possible care of the district; but certain small rivers, at a distance from Dundalk, have hitherto been to them a source of considerable loss. It is designed to attempt to remedy this state of things by forming a new district.

No. 16[1], or Ballycastle District

Extends from Donaghadee, county Down, to Portrush, county Antrim, containing portions of the counties of Down, Antrim, and Derry.

Close Seasons.

Tidal—Between 19th August and 4th February.

Fresh Water—19th August and 1st March. Cross lines—28th September and 16th March. Single rod and line—1st November and 1st February.

Engines used in 1877—25 salmon rods, 12 draft nets, and 14 bag nets.

Bye-Laws—Bush River.

Repealing definition of Bush River Estuary, as fixed by late Special Commissioners on 8th February, 1864.

Report.

The general state of the salmon fisheries, in this district, during 1878, was not satisfactory. There has been a slight falling off in the number of engines used in the district, compared with 1877. There were in use, in 1878, 22 salmon rods, 11 draft nets, and 14 bag nets.

The receipts were, for salmon rods, £22; for draft nets, £33; for bag nets, £140; making, with £32 11*s.* 3*d.* fines, and £60, rates on Poor Law valuation of several fisheries, a total of £287 11*s.* 3*d.*, as compared with £281 5*s.*, in 1877. From the apparent total receipts, £3 must be deducted; as, in one case, a draft net licence was irregularly issued without payment.

The average weight of salmon taken was about 7 lbs. The highest price given was 1*s.* 10*d.*; the lowest 8*d.*; average 10*d.* per lb. The take of salmon was less productive than in 1877.

The quantity of breeding fish observed was, also, less than in 1877.

No bailiffs are employed by the Board; but each proprietor of a fishery receives a certain sum, to be devoted to the payment of the bailiffs in his employ. For these payments certified vouchers have been produced, and entered in the accounts of the Board.

About thirty-five bailiffs are employed by private individuals—Sir F. E. Macnaghten, bart., Sir Frederick Boyd, bart., the Earl of Antrim, and Mr. John Finlay.

The neighbourhood of Stranocum, on the Bush, continues to be pre-eminent for poaching. Outrages, time after time, have been committed there, during the breeding season; and scenes of violence and lawlessness, constantly occurring, are calculated to demoralize the neighbourhood. An adequate force of police, for the protection of the water-bailiffs and the preservation of the peace of the locality, at any rate during the months of November, December, and January, is indispensable; and it is to be regretted that, though Sir Francis E. Macnaghten has offered to provide a house, and pay all expenses, if such a force was provided, he has been unable to obtain the men. If such an arrangement be not made, the Conservators consider that it will be necessary to place fire-arms in the hands of the water-bailiffs, for the protection of their lives, when in the discharge of their duty.

No. 15², or Coleraine District

Extends from Portrush, county Antrim, to Downhill boundary, county Derry, embracing parts of the counties Monaghan, Armagh, Down, Antrim, and Derry.

Close Seasons.

Tidal portion—Between 19th August and 4th February.

Fresh Water—Between 19th August and 1st March. Angling with single rods—Between 19th October and 16th March, save Bann and its tributaries. For Bann and its tributaries—Between 31st October and 1st March. Cross lines—28th September and 16th March. Pollen fishing by trammel nets in Lough Neagh—Between 31st October and 1st February.

Bye-Laws—Lough Neagh.

Prohibiting the use of draft nets for the capture of pollen.

Permitting pollen to be taken by trammel or set nets, composed of yarn of a fine texture, not less than ten hanks to the pound weight, doubled and twisted with a mesh of not less than one inch from knot to knot, between 1st February and 31st October.

Prohibiting the snatching or attempting to snatch salmon in any of the tidal or fresh waters of district.

Report.

The general state of the salmon fisheries, in this district, during 1878, was not quite so good as the previous year.

There was an increase in the total number of engines used in the district, over 1877, principally in trammel nets. There were in use, in 1878, 91 salmon rods, 135 draft nets, 108 trammel nets (as against 88, in 1877), 2 bag nets, 4 boxes, and 52 eel nets.

The receipts for 1878 were, for salmon rods, £91; draft nets, £405; trammel nets, £108; bag nets, £20; boxes, cribs, &c., £40; eel nets, £156; fines, £149 6*s.* 9*d.*; rates on Poor Law valuation of several fisheries, £210—making a total of £1,179 6*s.* 9*d.*, as compared with £1,105 8*s.* 2*d.* in 1877.

The average weight of salmon taken was about 10 lbs. The highest price given for salmon was 2*s.*; the lowest 10*d.*;—average 1*s.* per lb. The take of salmon and grilse,

in the lower or tidal portion of the district, was about equal to that of 1877; but, in the upper or freshwater portion, it was much less productive, owing to the dryness of the season.

The quantity of breeding fish observed was much less than in the previous year; when it exceeded that of 1876.

Sixty-three water-bailiffs and three inspectors are employed for the whole year by the Conservators; and three water-bailiffs by Mr. S. M. Alexander, and Mr. E. J. Harland.

The number of prosecutions by the Conservators was one hundred and thirty-two, of which fifty-two were for flax-water pollution; those undertaken by the constabulary amounted to thirty-three.

There was one very serious case, in which an inspector of water-bailiffs, and two of his men, after seizing a large number of nets, on Lough Neagh, were attacked by two boats full of men, and severely beaten, and the nets rescued. For this six men were prosecuted, convicted, and fined. The punishment seems inadequate to the offence.

It is desirable that the Constabulary should be instructed to render assistance, when necessary, without the loss of time consequent upon swearing informations; as, very often, during the delay, offenders against the fishery laws make their escape.

Inquiries were held at Toomebridge, on the 9th October, and at Coleraine, on the 10th October, by the Inspectors, and it was decided to make a Bye-Law prohibiting any boat, cot, or curragh, in the district, having on board thereof any net for the capture of salmon or trout in the tidal waters during the weekly close season, between the hours of 12 noon, on Saturday, and 4 A.M., on Monday. And also prohibiting any net for the capture of salmon, trout, or pollen, being on board in Lough Neagh or Lough Beg, between 11 A.M., on Saturday, and 4 A.M., on Monday morning. In consequence of large quantities of fish having been sent away by rail, during the annual close season, it is desirable that the authorities should have power to examine boxes and parcels supposed to contain salmon, trout, or pollen, during that season.

No. 15[1], or Londonderry District

Extends from Downhill boundary, county Derry, to Malin Head, county Donegal includes parts of Derry, Donegal, and Tyrone.

Close Seasons.

Tidal—Between 31st August and 15th April.

Fresh Water—Same. Angling with cross lines—28th September and 15th April Angling with single rod—Between 1st November and 1st February.

Bye-Laws.

Permitting the use of nets for capture of fish other than salmon and trout with meshes of half an inch from knot to knot in Baronscourt Lakes and Streams.

Permitting the use of nets with meshes of one inch from knot to knot in Lough Foyle and tidal parts of the river.

Prohibiting having nets for the capture of salmon or trout in or on board any boat, cot, or curragh, in the tidal waters of said district, which comprises the whole of the sea along the coast between Malin Head, in the county of Donegal, and the townland boundary between the townlands of Drumagully and Downhill, in the county of Londonderry, with the whole of the tideway along said coast and rivers and the whole of the tidal portion of the several rivers and their tributaries flowing into said coast between said points, at any time *between the hours of Twelve of the Clock at noon on Saturday, and Four of the Clock on Monday Morning.*

Report.

The general state of the salmon fisheries in this district was fairly good.

There has been an increase in the number of salmon rods, cross lines, and drift nets used, and a slight decrease in the other engines for taking fish. The number in use in 1878 was—77 salmon rods, 6 cross lines, 32 draft nets, 44 drift nets, 2 pole nets, 4 bag nets, and 3 stake nets.

The receipts were, for salmon rods, £77; cross lines, £12; draft nets, £96; drift nets, £132; pole nets, £4; bag nets, £40; stake nets, 90; with £46 18*s.* 3*d.* for fines; amount of rates on Poor Law Valuation on several fisheries, £95; subscriptions from lessees of the Irish Society, £605; making a total of £1,197 18*s.* 3*d.*, as against £699 4*s.* 2*d.* in 1877.

The average weight of salmon taken was 11 lbs.; of peale, 6½ lbs. The highest price given for salmon was 1*s.* 6*d.*; the lowest, 8*d.*; average, 10*d.* per lb.

The take of salmon and grilse in the district was less than in 1877.

The quantity of breeding fish observed was less than in 1877.

There was a considerable destruction of fry, during their descent to the sea, by unlicensed anglers, who say they fish for brown trout.

About 190 Water Bailiffs are employed by the Conservators from October to March, and a few during the entire year. The lessees of the Irish Society employ about 40 Bailiffs.

In consequence of complaints made to the Inspectors in regard to breaches of the weekly close season, we held inquiries at Londonderry, on the 24th April, and Moville on the 26th. From the evidence then given it was deemed expedient to enact a Bye-Law, prohibiting the practice of keeping any net for the capture of salmon or trout, in or on board any boat, cot, or curragh, in the tidal waters of this district, between 12 o'clock, noon, on Saturdays, and 4 o'clock on Monday mornings.

This Bye-Law has been approved by the Lord Lieutenant and Privy Council of Ireland.

A Bye-Law which awaits similar approval has also been made, prohibiting anyone to have in possession, between sunrise and sunset, at any season of the year, on or near the upper or fresh water portions of the rivers in this district, any spear, lyster, stroke-haul, or gaff, except when the latter may be used solely as auxiliary to angling for salmon legally, with rod and line.

The former Bye-Law remedies a practice noticed in the report for 1877, of my predecessor, Mr. Blake, whose lengthened and varied experience in connexion with Irish Fisheries rendered any suggestion of his especially valuable.

No. 14, or Letterkenny District

Extends from Malin Head to Rossan Point, county Donegal, and comprises the greater part of the county Donegal.

Close Seasons.

Tidal Water—Between 19th August and 4th February, and one mile above tideway, save Crana or Buncrana and Gweebarra Rivers. For Crana or Buncrana—Between 14th September and 15th April. For Gweebarra—Between 30th September and 1st April.

Fresh Water—Between 19th August and 1st March, save Crana or Buncrana River, Leenane and Gweebarra rivers, which are the same as tidal. Angling with cross lines—Same as netting in fresh water. Angling with single rod and line—Between 1st November and 1st February; save in Buncrana. Crana or Buncrana—Between 31st October and 1st March.

Bye-Law.

Permitting the use of nets for the capture of salmon or trout, with meshes of one inch from knot to knot, in the Crana or Buncrana river, and within one mile seawards and coastwards thereof.

Report.

The general state of the salmon fisheries, in this district, is good.

Except in the number of salmon rods, of which there were 7 less in 1878 than in 1877, there was, for the most part, a considerable increase in the engines used, over the previous year. In 1878, there were 46 salmon rods, 16 draft nets, 13 drift nets, 3 bag nets, 1 box, and 6 loop nets.

The receipts were, for salmon rods, £46; draft nets, £48; drift nets, £39; bag nets, £30; box, £10; loop nets, £6. The fines amounted to £3 15*s.* 5*d.*; sale of forfeited engines, 3*s.*; rates on Poor Law valuation of several fisheries, £14. The total amount of the annual receipts was £196 18*s.* 5*d.* (not including £1 16*s.* 5*d.*, interest on balance in Bank) as against £189 6*s.* 8*d.* received in 1877.

The average weight of salmon taken was 9½ lbs.; of peale, 6 lbs. The highest price given was 2*s.*, the lowest 4*d.*—average 8*d.* per lb.

The take of salmon and grilse in the district was less than in 1877.

The quantity of breeding fish observed is reported to be, also, much less.

One hundred and twenty-three are employed. Of these, 105 are employed for the whole year, and 18 during the close season, on the properties of the Marquis of

Conyngham, Lord Cloncurry, Lord George Hill, Sir James Stewart, and Messrs. Stewart, Olpherts, and Richardson.

The number of prosecutions instituted by the Conservators, in 1878, was 11, out of which there were 6 convictions. There were 8 persons prosecuted by the Constabulary, all of whom, except 2 were convicted.

The number of offences against the fishery laws have decreased.

It is satisfactory to be able to state that the Board has obtained the services of an efficient clerk, who will act as an inspector, in the district. The accounts for the year have been carefully kept, and there appears a balance in Bank of £270 3*s.* 5*d.*

No. 13, or Ballyshannon District

Extends from Rossan Point, county Donegal, to Mullaghmore, county Sligo.

Close Seasons.

For tidal and fresh waters—Between 19th August and 1st March, save River Eske and tributaries, which is 17th September and 1st April.

For angling with single rods—Between 9th October and 1st March, save Bunduff, which is between 30th September and 1st February; Bundrowes, between 30th September and 1st January, and, save Erne, between 30th September and 1st March.

Bye-Laws.

Permitting use of nets with meshes of one inch from knot to knot in tideway of River Erne.

Repealing bye-law of 24th February, 1860, prohibiting use of nets with meshes less than one inch for capture of fish of any kind on that part of the coast of the county Donegal inside or to the north-east and north of lines drawn from Rossan Point to Teelin Head, and from Teelin Head to Carrigan Head, and from Carrigan Head to Muckross Point, all in the barony of Bannagh and county of Donegal.

Permitting use of nets with meshes of one inch from knot to knot, for capture of fish by persons having right to use nets in Lough Erne, between Enniskillen and Belleek, between 1st May and first day of close season in each year.

Prohibiting the capture of fish of any description with the instrument commonly called and known by the name of the Spoonbait, or any other instrument of the like nature or device, during the months of January, February, and March in each year, in that part of the River Erne situated between the Falls of Belleek and a line drawn due south across the river, from the point of Castlecaldwell demesne, by the eastern point of the Muckinish, or White Island, to the opposite bank, all in the county of Fermanagh.

Permitting use of nets for the capture of fish with meshes of one inch from knot to knot (to be measured along the side of the square, or four inches to be measured all round each such mesh, such measurements being taken in the clear when the net is wet), within so much of the River Eany Water, or Inver, in the county of Donegal, as lies above the mouth of said river as defined.

Report.

The general state of the salmon fisheries in this district, during 1878, was good; though the take of salmon and grilse was less productive than in 1877.

The receipts for 1878 were, for salmon rods, £112; cross line and rods, £26; draft nets, £135; pole nets, £6; stake weirs, £30; box, &c., £40; eel nets, £29; from fines, £12 15*s.* 6*d.*; rates on Poor-law valuation of several fisheries, £5; interest on bank account £7 1*s.* 2*d.*; subscriptions received, £168 2*s.*; total, £570 18*s.* 8*d.*, as against £401 10*s.* in 1877.

The engines used were 112 salmon rods, 13 cross lines, 45 draft nets, 3 pole nets, 1 stake net, 4 boxes or cribs, and 29 gaps or eyes for eels.

The average weight of salmon taken was, 11½ lbs.; of peale, 7 lbs. The highest price given for salmon was 2*s.* 4*d.*; the lowest 10*d.*; the average price was 1*s.* per lb. Less breeding fish were observed in the district than in 1877.

Six prosecutions by the Conservators are reported. In 1877, the number was twelve. Two hundred bailiffs are employed by the Conservators, and three by the Marquis of Ely. Offences against the fishery laws are reported as on the increase.

Concluding Remarks.

Having only had the honour of acting as one of the Inspectors of Irish Fisheries during a portion of 1878, I shall not presume, this year, to offer many observations.

The Inspectors after inquiry held in Downpatrick, on 7th October, and having received requisitions unanimously agreed to by the Boards of Conservators of the Dundalk and Ballycastle districts, have decided to form a new district, extending from Ballagan Point, county Louth, to Carrickfergus, county Antrim, to be called Down district, bearing the number 16[2]. This step has been taken in order that the fisheries of that portion of Dundalk district lying in the county Down might receive more attention, and be further, it is hoped, developed, in the Quoile, and other rivers.

Matters which seem to call for the interference of the Executive or the Legislature more properly belong to the General Report.

WM. JOHNSTON.

In forwarding our individual reports upon the Salmon Fisheries in the divisions under our respective supervision, we consider it necessary to inform Your Grace that in regard to the observation respecting the Lismore and Listowel Weirs, and the removal of Fixed Engines in the River Shannon from the situations shewn in the several certificates, we are all of the opinion expressed by the Inspectors of the Districts.

The subjects referred to have, from time to time, received our most careful and anxious consideration, and we consider, if steps are not taken to enforce compliance with the provisions of the Act of 1863 and 1869, the result may, in the end, be very detrimental to the fisheries.

There are a few matters which require amendment by legislation, and on which we shall be prepared, if called upon, to submit our views to the Government.

As we have in the different reports gone fully into all details which we consider of importance, both as regards the Sea and Inland Fisheries, we beg to submit them for Your Grace's information without further comment.

We have the honour to be,

Your Grace's very obedient servants,

THOS. F. BRADY.
JOS. HAYES.
WM. JOHNSTON.

ALAN HORNSBY, *Secretary.*

Office of Irish Fisheries,
31*st March*, 1879.

APPENDIX.

No. 1.—List of Defaulters in Repayments under Irish Reproductive Loan Fund Act, and Loans Recalled.

Defaulters in Repayment of Instalments.

County.	Year.	Application Number.	Names.	Instalment. £	s.	d.	Date due.
Mayo,	1875,	50	Dominick and James Moran,	0	17	6	1st August, 1878.
Do.	„	51	Michael Moran,	0	17	6	1st August, 1878.
				0	17	6	1st September, 1878.
Do.	„	79	James Kennedy,	2	13	2	1st October, 1878.
Do.	„	109	Dominick Grehan,	1	15	0	1st August, 1878.
Do.	„	132	Michael Lavelle, Michael Caulfield,	2	2	0	1st February, 1878.
			Thomas Davis,	2	2	0	1st August, 1878.
				0	14	0	1st August, 1876.
Do.	„	133	Hugh and Patrick Monaghan, and	2	2	0	1st February, 1877.
			Francis Tougher,	2	2	0	1st August, 1877.
				2	2	0	1st February, 1878.
				2	2	0	1st August, 1878.
Do.	„	227	Pat Loftus and Pat Sullivan,	1	15	0	1st August, 1877.
				1	15	0	1st August, 1878.
				2	2	0	1st April, 1877.
Do.	1876,	15	John O'Malley and James Murphy,	2	2	0	1st October, 1877.
				2	2	0	1st April, 1878.
				2	2	0	1st October, 1878.
Do.	„	81	John Sullivan,	2	2	0	1st January, 1878.
				2	2	0	1st July, 1878.
Do.	„	130	Michael and Thomas Doherty, and John Reilly,	1	15	0	Do.
Do.	„	228	Martin Harte,	1	11	1	Do.
Do.	„	275	Thomas Reilly,	1	11	2	1st January, 1878.
				1	11	2	1st July, 1878.
				0	8	0	1st July, 1877.
Do.	„	285	David Reilly,	1	8	0	1st January, 1878.
				1	8	0	1st July, 1878.
Do.	1877,	112	Thomas Barrett,	1	17	3	1st August, 1878.
Do.	„	217	William Bournes, jun.,	2	5	1	Do.
Clare,	1875,	17	M. Daly,	0	17	6	1st February, 1878.
Do.	„	32	M. Conolan,	0	13	4	Do.
				1	1	0	1st March, 1878.
Do.	„	93	J. and F. Hennessy,	1	1	0	1st August, 1878.
				1	1	0	1st September, 1878.
Do.	„	144	J. Callaghan,	0	17	6	1st February, 1878.
Do.	1876,	364	Francis and M. Keane,	2	2	0	1st December, 1878.
Do.	1877,	10	John Fennell,	1	11	11	1st March, 1878.
Do.	„	27	John Crotty (John), and Martin	2	2	0	1st June, 1878.
			Finnell,	2	2	0	1st December, 1878.
Do.	„	241	Peter Shannon,	1	15	0	1st September, 1878.
Do.	„	42	James Donoghue,	1	1	0	1st December, 1878.
Sligo,	1875,	1,130	M. Leyden,	2	12	6	1st March, 1878.
				2	12	6	1st September, 1878.
				2	1	6	1st December, 1877.
Do.	„	1,330	J. Carway,	2	1	6	1st June, 1878.
Do.	1876,	52	John Costelloe,	1	6	7	1st November, 1878.
Do.	1877,	404	A. Burke,	2	2	0	1st September, 1878.
Do.	„	433	P. Cavanagh,	2	3	0	Do.
Galway,	1875,	720	Michael Holleran, sen., and John M'Donnell,	2	12	6	1st February, 1878.
				2	12	6	1st August, 1878.
Do.	1876,	19	J. M'Donough, jun.,	2	2	0	1st December, 1878.
Do.	„	89	M. Holleran, sen.,	2	12	6	Do.
Do.	„	100	Thomas Cooke,	1	15	0	Do.
Do.	„	101	Stephen Toole, Michael Lacey (Wm.), Michael Cloonan, Patrick Adley,	3	10	0	Do.
Do.	„	146	P. Lacey and P. Mongan,	2	12	6	Do.
Do.	„	147	P. and M. Davis,	2	12	6	Do.
Do.	„	192	B. Burke,	1	15	0	Do.
Do.	1878,	127	P. Mulavil,	1	0	9	Do.

Appendix 1.—Defaulters in Repayments—*continued.*

County.	Year.	Application Number.	Names.	Instalment. £ s. d.	Date due.
Cork,	1875,	578	R. Maguire,	3 10 0	1st March, 1878.
				3 10 0	1st September, 1878.
Do.	„	646	A. Harrington,	2 12 6	1st February, 1878.
				2 12 6	1st August, 1878.
Do.	„	847	Cornelius M'Carthy,	2 12 6	1st September, 1878.
Do.	1876,	9	Denis O'Leary,	8 15 0	1st December, 1878.
Do.	„	62	P. Donovan,	2 12 6	1st November, 1878.
Do.	„	175	Bartholomew Walsh,	2 12 6	1st June, 1878.
Do.	„	266	William Skinner,	3 10 0	1st December, 1878.
Do.	„	267	Florence O'Leary,	4 7 6	Do.
Kerry,	1875,	180	T. and J. Foley,	3 6 6	1st March, 1878.
				3 6 6	1st September, 1878.
Do.	„	290	J. Shea, jun.,	1 15 0	Do.
				5 5 0	1st September, 1877.
Do.	„	822	M. O'Connor,	5 5 0	1st March, 1878.
				5 5 0	1st September, 1878.
Do.	„	1,187	M. Fitzpatrick,	3 10 0	Do.
				3 19 10	1st October, 1877.
Do.	„	1,334	T. O'Connor,	3 19 10	1st April, 1878.
				3 19 10	1st October, 1878.
Do.	1876,	185	P. Keating,	4 7 6	1st December, 1878.
Do.	„	349	J. Segerson,	3 10 0	1st November, 1878.
Do.	1877,	288	J. Brennan,	3 10 0	1st December, 1878.
Do.	„	448	Timothy Foley,	5 1 6	1st August, 1878.

Loans Recalled to 31st December, 1878.

County.	Year.	Application No.	Name of Borrower.	Address.	Amount of Loan Advanced. £ s. d.	Date Recalled.	Date Repaid.
Mayo,	1877	430	Patrick Browne, jun.,	Money, Westport,	12 0 0	27 Sept. 1878	
Clare,	„	3	Denis Quinlan,	Carrigaholt,	6 0 0	30 Mar. 1878	
Do.	„	4	Thomas Enright,	Newtown, Carrigaholt,	12 0 0	22 Nov. 1877	
Do.	„	11	John Hickey,	Ross, do.	20 0 0	Do.	
Do.	„	13	Pat Clair and Michael Howe,	Liscannor,	12 0 0	15 Nov. 1877	17 Dec. 1877
Do.	„	80	Thomas Bonfill,	Kilclogher, Carrigaholt,	12 0 0	17 Nov. 1877	
Do.	„	87	Edmund Fennell,	Ross, do.	10 0 0	15 Dec. 1877	
Do.	„	94	Michael Scanlon,	Newtown, do.	10 0 0	22 Nov. 1877	
			John M'Mahon,	Moveen, do.			
Do.	„	97	Stephen Collins (Peter), Thos. Collins, and James Keane,	Tullig, do. Rahona, do.	12 0 0	8 June, 1878	
Do.	„	426	Denis Crowe,	Kiltrellig, do.	8 0 0	12 Apr. 1878	
Sligo,	1875	532	Luke Feeny,	Ballyconnell, Ballinfull,	15 0 0	30 Mar. 1876	
Do.	1876	113	James Moffatt,	Strandhill, Sligo,	20 0 0	18 Dec. 1876	5 June, 1877
Do.	1878	266	Terence Leyden, jun.,	Upper Rosses, Rosses Point,	24 0 0	13 Dec. 1878	
Galway,	1877	205	Michael Coyne and Thomas Joyce,	Mullaghglass, Letterfrack,	10 0 0	11 Oct. 1878	31 Jan. 1879
Do.	„	209	Patrick and John Malley,	Gorteenaglogh, do.	15 0 0	6 June, 1878	27 Feb. 1879
			Thomas Conneely, and John Malley,	Dawrosbeg, do. Mullaghglass, do.			
Do.	„	210	Gregory Conneely, John do. (Patrick), Peter do., John do. (Gregory)	Gorteenaglogh, do.	20 0 0	12 Apr. 1878	1 June, 1878
Do.	„	211	Patrick and Michael Murray, John Keane and John M'Donnell,	Ardnagreevagh, do.	20 0 0	6 June, 1878	28 Jan. 1879
Do.	„	223	William, John, and Patrick Henne,	Gorteenaglogh, do.	10 0 0	Do.	8 Aug. 1878
Do.	„	229	Joseph Conneely, Michael Mulkerrin, Thomas Henne and Joseph J. Conneely,	Do. do.	16 0 0	Do.	6 Aug. 1878
Do.	„	264	Martin Coyne,	Bannoge, do.	15 0 0	14 June, 1878	8 Oct. 1878
							20 Jan. 1879
Do.	„	279	Richard King,	Cloon, Cleggan, do.	10 0 0	Do.	27 Aug. 1878
Do.	„	409	Darby Heanne,	Lettergesh, Letterfrack,	10 0 0	6 June, 1878	20 Jan. 1879
Do.	„	410	John Hynes,	Croonlooaun, Rinvyle,	10 0 0	5 Feb. 1878	21 Feb. 1878
Do.	„	411	Michael King,	Lettergesh, Letterfrack,	10 0 0	6 June, 1878	
Do.	„	412	Thomas Conroy,	Do. do.	10 0 0	Do.	31 Jan. 1879
Cork,	1875	365	R. Minahane,	Ballyally, Skibbereen,	25 0 0	13 Dec. 1875	20 Jan. 1876
Do.	„	580	Patrick Keohane,	Toehead, Castletownsend,	20 0 0	4 Jan. 1876	3 Mar. 1876
Do.	1876	43	Daniel Collins,	Downeen, Rosscarberry,	10 0 0	9 July, 1878	29 July, 1878
Do.	1877	435	Thomas D. Notter,	Crookhaven, Skibbereen,	100 0 0	24 Oct. 1878	1 Nov. 1878
Do.	„	437	John Regan and John Hurley,	Ballinluig, Butlerstown,	15 0 0	7 Aug. 1878	
Do.	1878	34	John Sweeney,	Lissycrimeen, do.	35 0 0	5 July, 1878	
Kerry,	1875	181	Thomas Lynch,	Ballinrannig, Dingle,	30 0 0	24 Feb. 1876	26 Apr. 1876
Do.	1876	16	Michael Sullivan,	Farranreagh, Valentia,	109 0 0	18 Nov. 1878	
Do.	„	117	Michael and Timothy Sullivan,	Boolakeel, Cahirciveen,	25 0 0	6 Nov. 1878	30 Jan. 1879
Do.	1878	267	Patrick Shea,	Ballinskelligs,	12 0 0	Do.	11 Mar. 1879
Do.	„	406	James Moran,	Meelagulleen, Cahirciveen,	20 0 0	10 Dec. 1878	

Appendix No. 2.—Abstract of Returns from Coast-Guard of the Numbers of Vessels, Boats, and Crews, engaged in the Sea Fisheries in 1878.

No.	Name of District.	Registering Officer.	Solely engaged in Fishing.									Only partially employed in Fishing.									Totals.			No.
			First Class.			Second Class.			Third Class.			First Class.			Second Class.			Third Class.						
			Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	
1	Dublin,	Commander E. M. Dayrell, R.N.,	97	495	97	17	42	–	23	61	1	9	1	–	27	93	1	20	31	5	193	723	104	1
2	Arklow,	Commander P. R. Parker, R.N.,	9	44	4	236	862	40	9	30	–	–	13	–	45	353	21	46	45	2	345	1,347	67	2
3	Wexford,	Commander Hastings Dent, R.N.,	11	48	–	47	96	4	2	3	–	3	17	1	86	404	–	17	44	–	166	612	5	3
4	Waterford,	Commander Howard Kerr, R.N.,	12	36	11	8	13	–	–	–	–	1	4	–	92	261	–	24	42	7	137	356	18	4
5	Youghal,	Lieut. John W. Jones, R.N.,	8	40	–	15	85	3	10	92	2	1	4	–	64	266	1	30	123	–	128	610	6	5
6	Queenstown,	Commander L. M. Malet, R.N.,	7	27	1	67	161	26	24	115	2	–	–	–	43	118	6	68	143	20	209	564	55	6
7	Kinsale,	Commander A. Jephson, R.N.,	47	326	44	19	82	3	18	79	–	13	91	12	92	395	10	153	659	38	342	1,632	107	7
8	Skibbereen,	Lieut. Charles Cobb, R.N.,	7	45	–	44	174	6	26	103	4	11	66	1	78	379	9	106	459	9	272	1,226	29	8
9	Castletown Berehaven,	William Lugar, District Officer,	1	3	–	1	7	–	4	13	–	–	–	–	16	83	–	111	583	10	133	689	10	9
10	Killarney,	P. Mahony, District Officer,	9	36	–	41	131	–	83	311	–	2	8	–	43	231	2	136	678	7	314	1,395	9	10
11	Ballyheigue,	H. S. Nash, Divisional Officer,	–	–	–	9	16	3	–	–	–	1	3	–	25	75	–	46	142	–	81	236	3	11
12	Seafield,	Lieut. Claud Harding, R.N.,	–	–	–	–	–	–	14	42	–	–	–	–	1	2	–	140	367	4	155	411	4	12
13	Galway,	Lieut. John J. Hardinge, R.N.,	10	40	10	6	24	–	54	130	–	–	–	–	182	571	10	191	338	14	443	1,103	34	13
14	Clifden,	Lieut. T. H. Falcon, R.N.,	–	–	–	–	–	–	–	–	–	–	–	–	220	711	21	437	1,154	27	657	1,865	48	14
15	Keel,	Robt. Geo. Gibbon, Div. Officer,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	57	122	4	57	122	4	15
16	Belmullet,	Lieut. T. H. Beddoes, R.N.,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	183	505	–	183	505	–	16
17	Ballycastle, K.,	Lieut. Alfred Anderson, R.N.,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	151	561	–	151	561	–	17
18	Pullendiva,	Charles MacDonald,	–	–	–	–	–	–	10	21	6	–	–	–	–	–	–	36	144	1	46	165	7	18
19	Sligo,	Lieut. F. C. R. Baker, R.N.,	1	4	–	13	46	1	17	73	1	–	–	–	9	28	2	99	426	4	139	577	8	19
20	Killybegs,	William Daish, R.N., Inspecting Officer,	–	–	–	9	35	13	63	364	23	–	–	–	7	24	8	89	360	14	168	783	58	20
21	Guidore,	Charles Guard, District Officer,	–	–	–	1	4	–	–	–	–	–	–	–	17	50	8	24	79	8	42	133	16	21
22	Rathmullin,	Lieut. G. H. Duthie, R.N.,	3	12	2	20	88	–	10	21	–	–	–	–	78	110	12	75	104	9	186	335	23	22
23	Moville,	Commander Hamilton Dunlop, R.N.,	5	15	–	40	160	–	4	11	–	1	3	–	157	576	4	49	186	–	256	951	4	23
24	Ballycastle, Antrim,	Lieut. F. H. Chapman, R.N.,	–	–	–	22	75	–	1	3	–	1	2	–	91	146	2	25	44	2	140	270	4	24
25	Carrickfergus,	Commander H. W. Rochfort, R.N.,	–	–	–	36	72	2	6	11	–	–	–	–	2	6	–	7	25	2	51	114	4	25
26	Donaghadee,	Commander F. de V. Sanders, R.N.,	17	116	10	40	135	8	3	6	–	3	3	–	49	118	9	11	12	1	123	390	28	26
27	Strangford,	R. Barnes, Divisional Officer,	2	12	1	25	50	3	1	1	–	1	7	–	76	116	6	2	3	–	107	189	10	27
28	Newcastle,	Commander Cameron, R.N.,	1	7	1	28	108	–	–	–	–	43	272	21	69	227	11	16	28	–	157	642	33	28
29	Carlingford,	Lieut. F. Osburn, R.N.,	38	248	35	69	229	23	13	42	1	3	21	3	64	177	6	79	159	–	266	876	68	29
30	Malahide,	Commander S. Tuke, R.N.,	25	99	18	6	28	–	1	2	–	30	260	4	18	20	–	32	129	18	112	538	40	30
			310	1,553	234	819	2,723	135	396	1,534	40	123	775	42	1,651	5,540	149	2,460	7,695	206	5,759	19,920	806	

Appendix, No. 3.

Abstract of By-Laws, Orders, &c.

Appendix, No. 3.

Abstract of By-Laws, Orders, &c., in force on 1st January, 1879, relating to the *Sea and Oyster* Fisheries of Ireland.

Place affected by By-Law and Date thereof.	Nature of By-Law.
	TRAWLING.
Dublin Bay, (10th Oct., 1842.)	Prohibiting Trawling inside lines drawn from the Bailey Light-house at Howth, to the Eastern-most point of the rocks called the "Mugglins;" thence by a straight line to the Southern point of Dalkey Island; thence by a straight line across Dalkey Sound, in the direction of the signal station on Killiney Hill.
East Coast, (14th Feb., 1851.)	Prohibiting Trawling within a line drawn from the Nose of Howth, to the Eastern point of St. Patrick's Island (Skerries); thence to Clogher Head; thence to Dunany Point; thence to Cranfield Point, in the County Down.
Dundrum Bay, &c., (3rd Dec., 1851.)	Prohibiting Trawling from Hellyhunter Rock, off Cranfield Point, to St. John's Point, both in the County Down.
Belfast Lough, (27th Nov., 1869.)	Prohibiting Trawling in that part of said Lough of Belfast comprised within a straight line drawn from the Castle of Carrickfergus, in the County of the Town of Carrickfergus, to Rockport, in the County of Down, between the hours of Six o'Clock in the Evening and Six o'Clock in the Morning, during the Months of December, January, and February.
Donegal Bay, (16th Feb., 1857.)	Prohibiting Trawling within a straight line from the Bian Rock, to a place called Doorin Point.
Galway Bay, (9th Jan., 1854.)	When large shoals of Herrings shall have set in in the Bay, and while Boats are engaged in Drifting for Herrings or Mackerel, and when Boats shall commence Fishing for Herrings or Mackerel, that Trawl Boats shall keep at a distance of three miles from them.
(31st Aug., 1877.)	Repealing By-Law, dated 22nd March, 1843, prohibiting Trawling at all times within a straight line drawn from Barna Pier on the north to Gleninagh Castle on the south side of said bay.
Brandon Bay, (23rd Aug., 1860.)	Prohibiting Trawling within a line drawn from Brandon Point to Coosanea.
Bantry Bay, (27th March, 1858.)	Prohibiting Trawling within a straight line from Crowdy Point to Carrigskye Rock; and from thence to Reenavanny Point, on the North Shore of Whiddy Island. And
(11th Sept., 1861.)	Prohibiting Trawling between sunset and sunrise.
Waterford Harbour. (15th Dec., 1873.)	Prohibiting Trawling by Boats exceeding ten tons measurement, within a line drawn from Gaultier Cottage, County Waterford, to Broomhill Point, County Wexford.
Wexford Coast, (20th April, 1849.)	Prohibiting Trawling in all places where there are Boats engaged in Herring or Mackerel Drift Net Fishing; and that Trawl Boats shall keep at a distance of at least three miles from all boats fishing for Herrings or Mackerel, with Drift Nets. And whenever Herring or Mackerel Boats shall commence Drift Net Fishing in any place, on or off the Coast of Wexford, the Trawl Boats shall depart therefrom, and keep at least three miles distant from the Drift Net Herring or Mackerel Boats.
	TRAMMEL NETS.
Dungarvan Bay, (4th July, 1849.)	Prohibiting the use of Trammel and every other Fixed or Moored Net (except Bag or other Nets for the taking of Salmon) in Dungarvan Bay, within the limit formed as follows, namely, the space lying between a line passing due East and West, through the Northernmost point of Helvick Head, and a line passing due East and West through the Southernmost point of Ballinacourty Head, in the Co. Waterford; but to the North and East of the line through Ballinacourty Head, and to the South and West of the line through Helvick Head, such Trammel or Moored Nets may be set, and remain set in the water from Three o'Clock, p.m., of one day, until Nine o'Clock, a.m., in the following day, during January, March, October, November, and December in each Year; and from Five o'Clock, p.m., of one day, to Seven o'Clock, a.m., in the following day, during

Place affected by By-Law, and Date thereof.	Nature of By-Law.
Dungarvan Bay, &c., &c. —*continued.*	May, June, July, August, and September. Also prohibiting such Nets athwart or within 200 yards of any boat, which at the time of setting such net shall be moored, and the Crew thereof engaged in Line Fishing; and to every train of such Trammel or Moored Nets shall be attached at least one floating buoy or board, upon which shall be painted in legible characters not less than one inch in length, in white upon a black ground, the Letter of the District, and the name of the Owner to which such Net belongs.
Inver Bay, (24th Sept., 1860.)	Prohibiting the use of Trammel Nets within or to the North-east of a line drawn from the Mouth of the Bunlaghy River to Doorin Point.
Kenmare River Estuary, (31st Dec., 1864.)	Permitting within the Estuary of the Kenmare River, in the County of Kerry, and eastward of a line drawn from the western point of Lamb's Head to the western point of Cod's Head, the use of Trammel and other Moored Nets for the capture of Sea Fish from the hour of Three o'Clock in the Afternoon of any one day to the hour of Nine o'Clock in the Morning of the day next following, during the months of October, November, December, January, February, and March, in each year; and from the hour of Five o'Clock in the Afternoon of any one day to the hour of Seven o'Clock in the Morning of the day following, during the months of April, May, June, July, August, and September.
	GENERAL.
Drogheda & Dundalk Districts (East Coast). (22nd Oct., 1873.)	Prohibiting use of Draw or Wade Nets with Meshes less than three and a half inches for capture of Fish between Ben Head and mouth of Annagassan River.
Dundalk District, Strangford Lough, (1st Dec., 1873.)	Prohibiting use of Poke Nets for capture of Fish inside a line drawn across said Lough, from Mullog Point on the west to Ballyquintin Point on the east, between the last day of January and first day of November in each year.
Sea Coast, County Donegal, (30th Jan., 1874.)	Prohibiting use of Draw or Wade Nets for capture of Fish between Dunaff Head and Dunmore Head, and tidal parts of rivers flowing into the sea between said points and around the shores of Inishtrahull.
Donegal Bay, (21st April, 1874.)	Repealing By-law of 24th February, 1860, prohibiting use of Nets with Meshes less than one inch for capture of Fish of any kind on that part of the coast of the County Donegal inside or to the north-east and north of lines drawn from Rossan Point to Teelin Head, and from Teelin Head to Carrigan Head, and from Carrigan Head to Muckross Point, all in the Barony of Bannagh and County of Donegal.
	OYSTERS.
South-East Coast of Ireland from Wicklow Head to Carnsore Point, (1st Sept., 1868.)	That the Close Time, during which it shall not be lawful to dredge for, take, catch, or destroy any Oysters or Oyster Brood, on or off the South-east coast of Ireland, between Wicklow Head and Carnsore Point, shall be between the 30th April and the 1st September in each year.
Coasts of Dublin, Wicklow, and Wexford, (23rd April, 1869.) Approved by Her Majesty in Council, 29th April, 1869.	Prohibiting between the 30th April and 1st September in each year the dredging for, taking, catching, or destroying any Oyster or Oyster Brood on or off any part of the East and South-East Coast of Ireland, within the distance of Twenty Miles measured from a straight line drawn from the Eastern point of Lambay Island, in the County Dublin, to Carnsore Point, in the County Wexford, outside the exclusive Fishery Limits of the British Islands.
Wexford Coast, (8th April, 1862.)	First.—All persons engaged in fishing for or taking Oysters off the said Wexford Coast, south of Raven Point, shall cull all such Oysters as may be taken or caught; and shall not remove from any Fishing Ground or Oyster Bed any Oyster of less dimensions than three inches, at the greatest diameter thereof, and shall im-

APPENDIX, No. 3—*continued.*

ABSTRACT of BY-LAWS, ORDERS, &c., in force on 1st January, 1879, relating to the *Sea and Oyster* FISHERIES of IRELAND.

Place affected by By-Law, and Date thereof.	Nature of By-Law.	Place affected by By-Law, and Date thereof.	Nature of By-Law.
WEXFORD COAST, &c.—*continued.*	mediately throw back into the Sea all Oysters of less dimensions than aforesaid, as well as all gravel and fragments of shells as shall be raised or taken while engaged in such fishing; and no person shall take from any Oyster Bed, Rock, Strand, or Shore, off said Wexford Coast, south of Raven Point, any Oyster of less dimensions than three inches, at the greatest diameter thereof; and any person offending in any respect against this By-Law, Rule, or Regulation shall, for each offence, forfeit and pay a sum of Two Pounds. Second.—All persons are prohibited from throwing into the Sea, on any Oyster Bed, or Oyster Fishing Ground off the said Wexford Coast, the ballast of any boat, or any other matter or thing injurious or detrimental to the Oyster Fishery; and all persons acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds.	TRALEE BAY, &c. —*continued.*	or other implement for the taking of Oysters; and if, during the period aforesaid, there shall be on board any boat any such dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds. Second.—All persons engaged in fishing for or taking Oysters in said Bay of Tralee, shall cull all such Oysters as may be taken or caught; and shall not remove from any Fishing Ground or Oyster Bed any Oyster of less dimensions than two inches and one-half, at the greatest diameter thereof, and shall immediately throw back into the Sea all Oysters of less dimensions than aforesaid, as well as all gravel and fragments of shells as shall be raised or taken while engaged in such fishing; and no person shall take from any rock, strand, or shore of said Bay of Tralee, by any means whatsoever, any Oyster of less dimensions than two inches and one-half, at the greatest diameter thereof; nor sell, expose for sale, give, transfer, or purchase, receive, carry, or have in his or her custody or possession, any such Oysters so taken; and any person offending in any respect against this By-Law, Rule, or Regulation shall, for each offence, forfeit and pay a sum of Two Pounds.
CORK HARBOUR, (29th Feb., 1876.)	First.—That between the 1st day of May and the 1st day of September in any year, no boat shall have on board any dredge or other implement for the taking of Oysters; and if, between the periods aforesaid, there shall be on board any boat in said Cork Harbour and the Estuaries of the Rivers flowing into same, any such dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds. Second.—All persons engaged in fishing for or taking Oysters shall cull all such Oysters as may be taken or caught; and shall not remove from any Fishing Ground or Oyster Bed, any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof; and shall immediately throw back into the water all Oysters of less dimensions than aforesaid, as well as all gravel and fragments of shells as shall be raised or taken while engaged in such fishing; and no person shall take from any rock, strand, bed, or shore of said Cork Harbour and the Estuaries of the Rivers flowing into same, by any means whatsoever, any Oyster of less dimensions than two inches and one-half, at the greatest diameter thereof; nor sell, expose for sale, give, transfer, or purchase, receive, carry, or have in his or her custody or possession. any such Oysters so taken; and any person offending in any respect against this By-Law, Rule, or Regulation shall, for each offence, forfeit and pay a sum of Five Pounds. Third.—All persons are prohibited from throwing into the Water, on any Oyster Bed or Oyster Fishing Ground in said Cork Harbour or the Estuaries of the Rivers flowing into same, the ballast of any boat, or any other matter or thing injurious or detrimental to the Oyster Fishery; and all persons acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds. Fourth.—No person shall, between Sunset and Sunrise, dredge for, take, or catch any Oysters in said Cork Harbour or the Estuaries of the Rivers flowing into same; and every person acting contrary hereto shall, for each offence forfeit and pay a sum of Five Pounds.	RIVER SHANNON, &c. (29th Feb., 1876.)	First.—That during the Close Season for Oysters, which is between the 1st May and 1st September in the said River Shannon, or in any of the Bays or Inlets thereof, no boat, in the said River Shannon, or in any of the Bays or Inlets thereof, shall have on board any dredge or other implement for the taking of Oysters; and if, during the period aforesaid, there shall be on board any boat any such dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds. Second.—All persons engaged in fishing for or taking Oysters in said River Shannon, or in any of the Bays or Inlets thereof, shall cull all such Oysters as may be taken or caught, and shall not remove from any Fishing Ground or Oyster Bed any oyster of less dimensions than two inches and one-half at the greatest diameter thereof, and shall immediately throw back into the water all Oysters of less dimensions than aforesaid, as well as all gravel and fragments of shells as shall be raised or taken while engaged in such fishing; and no person shall take from any Rock, Strand, or Shore of said River Shannon, or of any of the Bays or Inlets thereof, by any means whatsoever, any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof; nor sell, expose for sale, give, transfer, or purchase, receive, carry, or have in his or her custody or possession any such Oysters so taken; and any person offending in any respect against this By-Law, Rule, or Regulation shall, for each offence, forfeit and pay a sum of Two Pounds. Third.—All persons are hereby prohibited from throwing into the water, on any Oyster Bed or Oyster Fishing Ground in said River Shannon, or in any of the Bays or Inlets thereof as aforesaid, the ballast of any boat, or any other matter or thing injurious or detrimental to the Oyster Fishery; and all persons acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds. Fourth.—No person shall, between sunset and sunrise, dredge for, take, or catch, any Oysters within said River Shannon, or within any of the Bays or Inlets thereof as aforesaid; and every person acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds.
KINSALE HARBOUR and BANDON RIVER, (22nd August, 1872.)	That all persons fishing for or taking Oysters in any part of the Fishing Grounds or Oyster Beds situated in Kinsale Harbour and Bandon River, in the County of Cork, shall cull all such Oysters as may be taken or caught, and shall not remove from such Fishing Grounds or Oyster Beds any Oyster of less dimensions than three inches at the greatest diameter thereof, but shall immediately throw back into the water all Oysters of less dimensions than aforesaid; and any person offending in any respect against this By-Law shall for each such offence forfeit and pay a sum of Two Pounds.	GALWAY BAY, (13th August, 1877.)	That the Close Time during which it shall not be lawful to dredge for, take, catch, or destroy by any means whatsoever any Oysters or Oyster Brood on or off the Public or Natural Oyster Beds within said Galway Bay, or in any of the Bays or Inlets thereof, or off or from any of the shores or rocks thereof, shall be between the 1st day of January and the 30th day of November in each year, both said days inclusive.
TRALEE BAY, (7th Aug., 1872.)	That the Close Time during which it shall not be lawful to dredge for, take, catch, or destroy any Oysters or Oyster Brood within said Tralee Bay, or off or from any of the shores or rocks thereof shall be between the 10th day of March and the 1st day of November in each year.	(8th Nov., 1877.)	First.—It shall not be lawful for any person to dredge for, take, or catch any Oysters in Galway Bay, or in any of the Bays or Inlets thereof, between the 1st day of January and
(29th Feb., 1876.)	First.—That during the Close Season for Oysters in the said Bay of Tralee, no boat, in the said Bay of Tralee, shall have on board any dredge		

APPENDIX, No. 3.

Abstract of By-Laws, Orders, &c.

APPENDIX, No. 3—*continued.*

ABSTRACT of BY-LAWS, ORDERS, &c., in force on 1st January, 1879, relating to the *Sea and Oyster* FISHERIES of IRELAND.

Place affected by By-Law, and Date thereof.	Nature of By-Law.	Place affected by By-Law, and Date thereof.	Nature of By-Law.
GALWAY BAY.—*continued.*	the 30th day of November in each year, both said days inclusive, being the Close Season for Oysters in the said Bay, Bays, and Inlets, or between Sunset and Sunrise at any Season of the year; and any person offending against this By-Law, Rule, or Regulation shall, for each such offence, forfeit and pay a sum of Three Pounds. Second.—No Boat, in Galway Bay, or in any of the Bays or Inlets thereof, shall, between the 1st day of January and the 30th day of November in each year, both said days inclusive, have on board any dredge or other implement for the taking of Oysters; and the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Three Pounds. Third.—All persons engaged in fishing for or taking Oysters in said Galway Bay, or in any of the Bays or Inlets thereof, shall, immediately on any Oysters being brought on board any boat, cull all such Oysters as may be taken or caught, and shall immediately throw back into the water all Oysters of less dimensions than three inches at the greatest diameter thereof, as well as all gravel and fragments of shells raised or taken while engaged in such fishing; and shall not remove from any Fishing Ground or Oyster Bed any Oyster of less dimensions than three inches at the greatest diameter thereof; and no person shall pick, gather, or take from any rock, strand, or shore of Galway Bay, or of any of the Bays or Inlets thereof, by any means whatsoever, any Oyster of less dimensions than three inches at the greatest diameter thereof, nor sell, expose for sale, give, transfer, or purchase, receive, carry, or have in his or her custody or possession any Oysters of less dimensions than aforesaid; and any person offending in any respect against this By-Law, Rule, or Regulation shall, for each offence, forfeit and pay a sum of Two Pounds.	SLIGO, &c., . . —*continued.*	Sligo, Ballisodare, and Drumcliffe Bays, by any means whatsoever, any Oyster of less dimensions than two inches and one-half, at the greatest diameter thereof, nor sell, expose for sale, give, transfer, or purchase, receive, carry, or have in his or her custody or possession any such Oysters so taken; and any person offending in any respect against this By-Law, Rule, or Regulation shall, for each offence, forfeit and pay a sum of Two Pounds. Third.—All persons are hereby prohibited from throwing into the water on any Oyster Bed, or Oyster Fishing Ground in said Sligo, Ballisodare, and Drumcliffe Bays, the ballast of any boat, or any other matter or thing injurious or detrimental to the Oyster Fishery; and all persons acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds. Fourth.—Every dredge or other implement for the taking of Oysters shall have a number corresponding with the number of the boat on which it is employed, or to which it belongs, stamped thereon, and all persons acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds.
CLEW BAY, ACHILL SOUND, BLACKSOD and BROADHAVEN BAYS and the Bays connected therewith. (12th April, 1877.)	Prohibiting for three years from the 1st October, 1877, the dredging for, taking, catching, or destroying, by any means whatsoever, any Oyster or Oyster Brood in any part of the said Clew Bay, Achill Sound, Blacksod and Broadhaven Bays, or in any of the Bays or Inlets thereof. And any person dredging for, taking, catching, or destroying, by any means whatsoever, any Oysters or Oyster Brood in said Bays or Inlets contrary hereto, during the period aforesaid, shall, for each offence, forfeit and pay a penalty of Five Pounds. "During the period aforesaid, no Boat shall have on board any dredge or other implement for the taking of Oysters in the said Clew Bay, Achill Sound, Blacksod and Broadhaven Bays, and the Bays or Inlets connected therewith; and if, during the period aforesaid, there shall be on board any Boat any such dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds."	LOUGH SWILLY, &c., &c. (15th Feb., 1876.)	First.—That during the Close Season for Oysters in the said Lough Swilly, or in any of the Bays, Creeks, or Inlets thereof (which is between 1st May and 1st September), no boat, in the said Lough Swilly, or in any of the Bays, Creeks, or Inlets thereof, shall have on board any dredge or other implement for the taking of Oysters; and if, during the period aforesaid, there shall be on board any boat any such dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds. Second.—All persons engaged in fishing for or taking Oysters in said Lough Swilly, or in any of the Bays, Creeks, or Inlets thereof, shall cull all such Oysters as may be taken or caught; and shall not remove from any Fishing Ground or Oyster Bed any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof; and shall immediately throw back into the sea all Oysters of less dimensions than aforesaid, as well as all gravel and fragments of shells as shall be raised or taken while engaged in such fishing; and no person shall take from any Rock, Strand, or Shore of said Lough Swilly, or of any of the Bays, Creeks, or Inlets thereof, by any means whatsoever, any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof, nor sell, expose for sale, give, transfer, or purchase, receive, carry, or have in his or her custody or possession any such Oysters of less dimensions than aforesaid; and any person offending in any respect against this By-Law, Rule, or Regulation shall, for each offence, forfeit and pay a sum of Two Pounds. Third.—All persons are hereby prohibited from throwing into the water, on any Oyster Bed, or Oyster Fishing Ground, in said Lough Swilly, or in any of the Bays, Creeks, or Inlets thereof as aforesaid, the ballast of any boat, or any other matter or thing injurious or detrimental to the Oyster Fishery; and all persons acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds.
SLIGO, BALLISODARE, and DRUMCLIFFE BAYS. (29th April, 1876.)	First.—That during the Close Season for Oysters in the said Sligo, Ballisodare, and Drumcliffe Bays, which is between 1st May and 1st September, no boat, in the said Sligo, Ballisodare, and Drumcliffe Bays, shall have on board any dredge or other implement for the taking of Oysters, and if, during the Close Season aforesaid, there shall be on board any boat any such dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds. Second.—All persons engaged in fishing for or taking Oysters in said Sligo, Ballisodare, and Drumcliffe Bays, shall cull all such Oysters as may be taken or caught, and shall not remove from any Fishing Ground or Oyster Bed any Oyster of less dimensions than two inches and one-half, at the greatest diameter thereof, and shall immediately throw back into the water all oysters of less dimensions than aforesaid, as well as all gravel and fragments of shells as shall be raised or taken while engaged in such fishing; and no person shall take from any Rock, Strand, or Shore of said	STRANGFORD LOUGH (13th Nov., 1877.)	That the Close Time during which it shall not be lawful to dredge for, take, catch, or destroy by any means whatsoever any Oysters or Oyster Brood on or off the Public or Natural Oysters Beds within said Strangford Lough, or off or from any of the shores or rocks thereof, shall be between the 1st day of March and the 31st day of August in each year, both said days inclusive.
		(31st Dec. 1877.)	First.—Between the first day of March and the first day of September in any year, that being the close time within which it is not lawful to dredge for, take, catch, or destroy any Oyster or Oyster Brood in Strangford Lough, no boat in Strangford Lough shall have on board any dredge or other implement for the taking of Oysters; and if, between the periods aforesaid, there shall be on board any boat any such

Appendix No. 3—*continued.*

Abstract of By-Laws, Orders, &c., in force on 1st January, 1879, relating to the *Sea and Oyster* Fisheries of Ireland.

Place affected by By-Law, and Date thereof.	Nature of By-Law.	Place affected by By-Law, and Date thereof.	Nature of By-Law.
Strangford Lough—*continued.*	dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds. Second.—All persons engaged in fishing for or taking Oysters in Strangford Lough shall, immediately on any Oysters being brought on board any boat, cull all such Oysters as may be taken or caught; and shall not remove from any fishing ground or oyster bed any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof, and shall immediately throw back into the sea all Oysters of less dimensions than aforesaid, as well as all gravel and fragments of shells raised or taken in such fishing; and no person shall take from any rock, strand or shore of Strangford Lough, by any means whatsoever, any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof; and no person shall sell, expose for sale, give, transfer or purchase, receive, carry, or have in his or her custody or possession, any such Oysters so taken; and any person offending in any respect against this by-law, rule, or regulation shall, for each offence, forfeit and pay a sum of Two Pounds. Third.—No person shall, between sunset and sunrise, dredge for, take, or catch, any Oysters within Strangford Lough aforesaid; and every person acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds.	Carlingford Lough—*con.* (24th Nov., 1877.)	First.—Between the first day of March and the first day of November in any year, that being the close time within which it is not lawful to dredge for, take, catch, or destroy any Oyster or Oyster Brood in Carlingford Lough, no boat in Carlingford Lough shall have on board any Dredge or other implement for the taking of Oysters; and if, between the periods aforesaid, there shall be on board any boat any such Dredge or other implement for the taking of Oysters, the master or owner of such boat shall, for each such offence, forfeit and pay a sum of Two Pounds. Second.—All persons engaged in fishing for or taking Oysters in Carlingford Lough shall, immediately on any Oysters being taken, cull all such Oysters as may be taken or caught; and shall immediately throw back into the sea all Oysters of less dimensions than two inches and one-half at the greatest diameter thereof, as well as all gravel and fragments of shells raised or taken in such fishing; and shall not remove from any fishing ground or oyster bed any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof; and no person shall take from any rock, strand, or shore of Carlingford Lough, by any means whatsoever, any Oyster of less dimensions than two inches and one-half at the greatest diameter thereof; and no person shall sell, expose for sale, give, transfer or purchase, receive, carry or have in his or her custody or possession any Oysters of less dimensions than aforesaid so taken; and any person offending in any respect against this bye-law, rule, or regulation shall, for each offence, forfeit and pay a sum of Two Pounds. Third.—No person shall, between sunset and sunrise, dredge for, take, or catch, any Oysters within Carlingford Lough aforesaid; and every person acting contrary hereto shall, for each offence, forfeit and pay a sum of Two Pounds.
Carlingford Lough. (21st June, 1877.)	Prohibiting at any time after the 1st day of November, 1877, to use for the taking of Oysters in any part of Carlingford Lough, in either of the counties of Louth and Down respectively, the instrument commonly called and known as the grape, or any other instrument or device of the like construction or nature. Any person offending against this By-Law shall forfeit and pay for each offence the sum of Four Pounds, and every such grape, or other instrument or device which shall be used contrary to this By-Law, shall be forfeited.		

Appendix, No. 4.

List of Oyster Licences Revoked up to date of this Report.

Date of Licence.	Persons to whom granted.	Locality of Beds.	No. of Acres.	Date of Revocation.
County Cork.				
1857. 27th August,	Thomas Eccles,	Glengarriffe Harbour,	9	21st October, 1876.
1867. 10th July,	M. J. C. Longfield,	Roaringwater Bay,	310	7th March, 1877.
1869. 13th February,	Earl of Bantry,	Adrigole Harbour,	18	9th March, 1878.
1869. 15th March,	John Warren Payne,	Bantry Bay,	51	19th October, 1876
1871. 22nd March,	Earl of Bantry and T. J. Leahy,	Berehaven,	122	15th March, 1878
County Kerry.				
1860. 3rd February,	Knight of Kerry,	Valencia Harbour,	78	8th March, 1878.
1867. 10th July,	Thomas Sandes,	River Shannon,	780	28th October, 1876.
1869. 13th February,	Henry Herbert,	Kenmare Bay,	20	28th May, 1877.
1871. 27th March,	Earl of Bantry,	Ardgroom Harbour,	240	16th December, 1876.
County Galway.				
1864. 31st October,	R. E. Lynch Athy,	Galway Bay,	100	29th March, 1876.
1864. 31st October,	P. M. Lynch,	Do.,	320	26th April, 1877.
1864. 31st December,	T. Young Prior,	Ballinakill Harbour,	90	16th June, 1876.
1865. 1st December,	Captain Acheson,	Do.,	18	10th April, 1876.
1865. 1st December,	Robert M'Keown,	Killary Bay,	61	10th April, 1876.
1867. 10th July,	William and James St. George,	Galway Bay,	810	26th January, 1872.
1867. 10th July,	Christopher T. Redington,	Do.	650	29th March, 1876.
County Mayo.				
1865. 13th April,	Marquess of Sligo,	Clew Bay,	190	28th October, 1876.
1865. 2nd November,	Law Life Assurance Society,	Do.,	118	11th January, 1877.
1865. 1st December,	Marquess of Sligo,	Do.,	26	9th October, 1876.
1866. 20th April,	Do.,	Do.,	270	9th October, 1876.
1869. 14th June,	William Little,	Killala Bay,	190	19th October, 1876.
1872. 16th December,	William O. M'Cormick,	Rathfran Bay,	95	16th January, 1877.
1873. 8th December,	Mary Fegan,	Clew Bay,	26	24th May, 1878.
County Antrim.				
1862. 3rd March,	James Walker,	Belfast Lough,	137	7th March, 1877
County Waterford.				
1864. 11th November,	John R. Dower,	Dungarvan Harbour,	27	22nd March, 1877.

APPENDIX, No. 5.

APPENDIX,

LIST of LICENSES to Plant OYSTER BEDS *in force* on 31st December,

No. of License.	Date of License.	Persons to whom Granted.	Present Owner or Lessee.	Locality of Beds.	Area of Beds. A. R. P.	Average area of Beds available. Acres.
	County Dublin.					
72	10th July, 1867,	Richard D. Kane,	Richard D Kane,	Howth Strand,	36 0 0	18
	County Wicklow.					
143	31st August, 1876,	Henry Pomeroy Truell,	Henry Pomeroy Truell,	Clonmannon Lough,	1 30	
	County Wexford.					
62	20th April, 1866,	William Dargan,	John Hoey,	Wexford Harbour,	70 0 0	70
150	7th January, 1878,	Thomas J. Hutchinson,	Thomas J. Hutchinson,	Duncormick Estuary,	11 2 31	
	County Waterford.					
30	6th March, 1862,	Edmund Power,	Edmund Power,	Tramore Bay,	270 0 0	100
32	2nd February, 1864,	Earl Fortescue,	Earl Fortescue,	Do.,	83 0 0	
41	11th November, 1864,	A. Boate,	John Kendall,	Dungarvan Harbour,	65 0 0	
134	27th October, 1874,	John Kendall,	Do.,	Dungarvan Bay,	240 2 32	
	County Cork.					
4	24th February, 1849,	R. T. Evanson,	M. H. Morris,	Dunmanus Bay,	19 0 10	
14	30th July, 1856,	Lord Charles P. P. Clinton,	Lord Charles P.P. Clinton,	Bear Haven,	45 0 0	
24	4th October, 1860,	M. C. Cramer,	M. C. Cramer,	Oyster Haven,	20 0 0	
78	9th October, 1860,	Ebenezer Pike,	Ebenezer Pike,	Lough Mahon, Estuary of Lee.	47 0 0	
88	31st October, 1864,	Robert T. Atkins,	Robert T. Atkins,	Lough Hyne,	25 0 0	12
43	31st December, 1864,	Captain W. F. Barry,	Captain W. F. Barry,	Glandore Harbour,	68 0 0	68
55	1st December, 1865,	Thomas M'Carthy Collins,	Thomas M'Carthy Collins,	Roaringwater Bay,	75 0 0	75
67	10th July, 1867,	Horatio H. Townsend,	Horatio H. Townsend,	Skull Harbour	230 0 0	
75	15th July, 1867,	Mrs. Elizabeth Bury,	John O'Leary,	Lough Mahon,	70 0 0	20
77	Do.,	John Smyth,	John Smyth,	Midleton River,	10 2 0	5
79	16th July, 1867,	Thomas Hicks,	Thomas Hicks,	Roaringwater Bay,	45 0 0	45
83	11th February, 1868,	Richard Lyons,	Richard Lyons,	Midleton River,	15 0 0	2
85	13th March, 1868,	Stephen Browne,	Stephen Browne,	Dunmanus Bay,	9 0 0	4
89	13th February, 1869,	Earl of Bantry,	Earl of Bantry,	Glengariffe Harbour,	60 0 0	10
95	14th June, 1869,	Mrs. Catherine Bourne,	Mrs. Catherine Bourne,	Courtmacsherry Bay,	60 0 0	
105	27th March, 1871,	Thomas Hicks,	Thomas Hicks,	Roaringwater Bay,	30 0 0	
117	21st June, 1872,	Earl of Bandon,	Earl of Bandon,	Dunmanus Bay,	132 3 31	
119	14th October, 1872,	S. R. Townsend,	S. R. Townsend,	Rincolisky Harbour, Roaringwater Bay.	240 3 30	240
123	6th March, 1873,	Lt. Col. Wm. H. Longfield,	S. A. Beamish,	Cork Harbour,	22 2 30	3
124	Do.,	Thomas Hicks,	Thomas Hicks,	Roaringwater Bay,	145 0 30	
129	29th January, 1874,	Sir Henry W. Becher, bt.,	Sir Henry W. Becher, bt.,	Lough Hyne,	30 1 24	
145	27th December, 1876,	Standish D. O'Grady and Rev. E. H. Newenham.	Standish D. O'Grady and Rev. E. H. Newenham.	Owenboy River,	A39 1 2 B36 2 19	21 24
	County Kerry.					
3	9th June, 1848,	F. H. Downing,	J. Townsend Trench,	Off Daurus Point,	3 2 28	3
5	5th February, 1851,	John Mahony,	Colonel Goff,	Estuary of Kenmare River,	165 2 0	140
6	Do.,	Rev. Denis Mahony,	R. J. Mahony,	Do.,	147 2 0	15-20
51	12th May, 1865,	Lord Baron Ventry,	Lord Baron Ventry,	Dingle Harbour,	130 0 0	
60	30th December, 1865,	Richard Mahony,	Richard Mahony,	Kenmare Estuary,	30 0 0	1

No. 5.

1878, and Substance of Reports received as to state of Beds.

No. of License.	Substance of Reports received as to state of Beds.
	County Dublin.
72	Purchased and put down over 9,000 full-grown oysters. Sold 1,500 at about 10s. per hundred: No spat fallen, owing to tidal currents. No French oysters laid down. No general remarks.
	County Wicklow.
143	In consequence of ill-health was advised to spend the winter abroad, and was therefore unable to restock the bed since date of last report.
	County Wexford.
62	Nothing done since last report, embankment at Big Island not being completed.
150	No replies received.
	County Waterford.
30	Nothing done since last report. No oysters taken off, except a few for private use. None sold. Could not procure any brood oysters. No appearance of spat. Has always been of opinion that this bed is useless for breeding, but favourably situated for fattening. Hopes to be able to procure seed oysters from some natural bed.
32	Nothing done since last report. Beds in a very indifferent state, many oysters destroyed by influx of sand. French oysters can hardly be said to have succeeded, though no very large proportion died in transit. A good many perished subsequently from various causes, and general result of experiment does not encourage a repetition on a larger scale.
41	No replies received.
134	Do.
	County Cork.
4	Nothing done since last report. States to clean the bed, lay and protect oysters, would require more care and capital than he could afford to give to it. Oysters appear to fatten well on it, but don't increase in number.
14	Bed cleared of weeds, mussels, &c. No oysters taken off, and none laid down. Noticed some spat, but not in large quantities. Is sorry to say bed is not in a good state. Is informed oysters are getting into deep waters. They are not increasing on the beds. Strongly suspects they are stolen. Has from time to time noticed that oysters are to be found in deep water, and thinks this attributable to the fresh water being forced into a particular channel. Has lately ordered embankment to be knocked down so that the fresh water may spread over the entire strand.
24	No replies received.
25	States it is useless to do anything to cultivate oysters until there is some simple way of protecting them from being stolen.
38	In consequence of illness is unable to attend to business.
43	Believes bed is most favourably circumstanced, but has not laid down any oysters, having ascertained that expense would be considerable. Would be glad to meet with any person disposed to stock bed.
55	Bed preserved. No oysters taken off or laid down. Being from home is unable to report as to fall of spat. A fair stock of oysters on at present, and if he can only succeed in preserving bed from being poached it will become valuable, as oysters thrive almost everywhere along this coast—that is when laid down in proper places.
67	Nothing done to this bed since last report.
75	Bed cleaned. About 25,000 oysters sold in 1878, and 100,000 laid down. Spat showed on only about 200 oysters. Beds in fair state. All oysters laid down were brought from France. About 1,000 oysters were lost in transit, owing to delay on arrival of steamer, bad packing, &c.
77	Beds cleared of mussels and weeds, and outer portion worked with dredge to stir and clear ground. 1,200 oysters sold. None laid down, but purposes laying down 50,000 in 1879. A fall of spat noticed every year, little of which comes to any use. Must be killed by crabs or other enemies. Beds fairly prosperous at present. Laid down 110,000 French oysters, which have succeeded very well. Few died in transit except from actual injury. A number died afterwards, which cannot well be accounted for, but probably from the effects of the journey, as none appeared to have been *forced*, nor had those that died grown after being laid. If loans were made for the purpose of stocking oyster beds, to be repaid in three or four instalments, many would avail of it.
79	Nothing done since last report. No oysters sold. Is not aware of any fall of spat. Fears from roughness of channel shall have to wait a long time for success.
83	Bed kept clean, and replaced any oysters thrown out too far by wind and sea. Sold about 2,000 oysters in 1878. Did not lay down any. Some spat, but very inconsiderable. Bed in good condition, some small oysters doing well, and will be fit for market next year, in 1880. Has not laid down any French oysters since last report, but they have always been a great success with him. Only that his means are limited, and has met with reverses, would go in largely for them. There are very few lost in transit, say about 5 per hundred. Would advise anyone buying to get the larger size. The small ones did well with him, but took three years to become saleable. The large ones are fit to sell the year after breeding.
85	Has laid down a wooden frame to form a concrete fence to protect bed from swell of the Atlantic, but frame was carried away by the swell. Hopes to make experiment more successfully this spring. Laid down no oysters, fence not being completed. No fall of spat. Has laid down French oysters previous years.
89	No replies received.
95	Do.
105	Nothing done since last report. No oysters sold. No fall of spat noticed. No French oysters laid down.
117	Nothing done to bed since last report. No oysters sold, none laid down. No spat.
119	Nothing done since last report. Very little spat. Considerable quantity of small oysters on bed with small proportion of those once so plenty. No French oysters laid down. Had beds dredged and found oysters very little grown, although 2 years down, what were dredged were too small for sale.
123	No replies received.
124	Some replies as to license, No. 105.
129	Nothing done since last report. No oysters taken off or sold and none put down. No signs of spat. French oysters did not succeed; many died in transit and on the beds. Thinks there must be some vermin which attack the oysters, as there are numbers of double shells empty. The oysters still alive are increasing in size. Fears bed not well situated.
145	Over 81,000 French oysters laid down, and more ordered, but have not arrived, being delayed owing to the severity of the winter. No oysters sold. No fall of spat. Cannot report as to state of beds as they have not been tried since oysters laid down. The oysters arrived in good condition.
	County Kerry.
3	Nothing done since last report.
5	Bed allowed to rest since last report. No oysters taken off or sold. None put down. No appearance of spat. 10,000 French oysters were laid down but do not appear to have succeeded so far as increasing in number, but they did not die in transit. Beds appear to be suited only for fattening not for breeding, though some years ago they bred well.
6	Oysters previously planted cared, and collectors put down. About 2,000 sold, none planted in 1878. No appearance of spat. Does not consider oysters very promising. Cannot say that French oysters succeeded. A good many died in transit and on the beds.
51	Nothing done since last report, no oysters taken off. Intends laying down a large quantity of oysters on the bed.
60	Best spatting ground cleaned and vermin destroyed. No oysters taken off bed and none laid down. A slight fall of spat. Considers beds slowly improving.

APPENDIX, No. 5.

APPENDIX,

LIST of LICENSES to Plant OYSTER BEDS *in force* on 31st December,

No. of License.	Date of License.	Persons to whom Granted.	Present Owner or Lessee.	Locality of Beds.	Area of Beds. A. R. P.	Average area of Beds available.
	County Kerry—*con.*					Acres.
78	15th July, 1867,	Stephen E. Collis,	Stephen E. Collis,	River Shannon,	212 0 0	
84	11th February, 1868,	Charles Sandes,	Charles Sandes,	River Shannon,	56 0 0	15-20
91	11th March, 1869,	Richard J. Mahony,	Richard J. Mahony,	Kenmare Bay,	46 0 0	8
92	Do.,	Thos. Kingston Sullivan,	Thos. Kingston Sullivan,	Do.,	195 0 0	
125	14th June, 1873,	Robert M'Cowen,	Robert M'Cowen,	Barrow Harbour,	84 1 26	10
154	30th November, 1878,	Samuel T. Heard,	Samuel T. Heard,	Kenmare Bay,	82 0 17	
155	Do.,	Do.,	Do.,	Do.,	117 3 35	
	County Clare.					
28	14th February, 1862,	Robert W. C. Reeves,	Robert W. C. Reeves,	Clonderlaw Bay,	112 0 0	80
34	10th June, 1864,	Colonel C. M. Vandeleur,	Colonel C. M. Vandeleur,	Poulnasherry Bay,	190 0 0	15
80	16th July, 1867,	Robert W. C. Reeves,	Robert W. C. Reeves,	River Shannon,	30 0 0	16
	County Galway.					
12	15th November, 1854,	J. K. Boswell,	William Young,	Ballyconnelly Bay,	233 0 0	23
15	21st August, 1856,	William Foreman,	John Kendall,	Ardbear Bay,	90 2 0	2
17	15th February, 1858,	Rev. A. Magee,	Rev. A. Magee,	Streamstown and Cleggan Bays.	277 0 0	10
18	Do.,	A. C. Lambert,	A. C. Lambert,	Killary Harbour,	114 0 0	55
19	3rd February, 1860,	Rev. R. H. Wall,	Walter S. Wall,	Mannin & Ardbear Bays,	348 0 0	160
23	11th May, 1860,	Edward Browne,	Gillman Browne,	Ballinakill Harbour,	223 0 0	50
27	10th January, 1861,	William Forbes,	William Forbes,	Meenwish Bay,	225 0 0	
33	6th April, 1864,	Lord Wallscourt,	Lord Wallscourt,	Galway Bay,	1,770 0 0	100
37	1st October, 1864,	John Kendall,	John Kendall,	Ardbear & Mannin Bays,	236 0 0	10
44	31st December, 1864,	C. P. Archer,	Thomas Russell,	Ballinakill Harbour,	48 0 0	
46	Do.,	P. Macauley,	Mitchell Henry, M.P.,	Ballinakill and Barnaderg Bays.	150 0 0	150
81	24th July, 1867,	Francis J. Graham,	Francis J. Graham,	Barnaderg Bay,	90 0 0	1
90	4th March, 1869,	John P. Nolan,	John P. Nolan,	Ard Bay,	290 0 0	290
114	26th December, 1871,	Colin Hugh Thomson,	Colin Hugh Thomson,	Killary Bay,	201 2 0	50
115	9th February, 1872,	W. and J. St. George,	W. and J. St. George,	Galway Bay,	810 0 0	80
128	31st December, 1873,	Gillman Browne,	Gillman Browne,	Ballynakill Bay,	73 3 5	
130	10th April, 1874,	Rev. R. Gibbings, D.D.,	Rev. R. Gibbings, D.D.,	Kingstown Bay,	133 2 34	30
146	28th December, 1876,	Edmond O'Flaherty,	Edmond O'Flaherty,	Camus Bay,	187 3 22	
149	30th June, 1877,	Lord Wallscourt,	Lord Wallscourt,	Galway Bay,	153 3 8	
153	30th October, 1878,	Mitchell Henry,	Mitchell Henry,	Ballynakill Harbour,	390 3 0	
	County Mayo.					
1	5th November, 1846,	W. H. Carter,	W. H Carter,	Trawmore Bay,	19 1 11	
8	17th November, 1852,	John C. Garvey,	Captain Geo. Austin,	Clew Bay,	108 3 33	54
11	15th November, 1854,	Hon. David Plunket,	James M'Donnell,	Killary Harbour,	288 0 0	
13	18th July, 1855,	John Richards,	John Richards,	Blacksod Bay,	90 0 0	5
21	3rd February, 1860,	Captain W. Houston,	William Barber,	Killary Harbour,	43 0 0	21
22	13th February, 1860,	William M'Cormick,	W. Dickens,	Achill Sound,	149 0 0	100
31	29th May, 1863,	George Clive,	Henry W. Birch,	Do.,	489 0 0	2
35	10th June, 1864,	A. W. Wyndham,	Victor C. Kennedy,	Newport Bay,	80 0 0	10
36	30th September, 1864,	Captain George Austin,	Captain George Austin,	Westport Bay,	194 0 0	97
47	31st December, 1864,	Colonel F. A. K. Gore,	Sir Chas. A. Gore, bart.,	Killala Bay,	375 0 0	30
53	2nd November, 1865,	Marquess of Sligo,	Marquess of Sligo,	Clew Bay,	25 0 0	25
54	1st December, 1865,	Most Rev. Dr. M'Hale,	Rev. Thomas M'Hale, Rev. Canon Bourke, Rev. James M'Gee, trustees.	Shores of Achill Island,	125 0 0	60
64	21st April, 1866,	Miss Anne Fowler,	Henry James F. Moran,	Blacksod Bay,	11 0 0	7
89	10th July, 1867,	Mrs. Elizabeth Atkinson,	J. Gallagher,	Broadhaven Bay,	100 0 0	15-20

No. 5—*continued.*

1878, and Substance of Reports received as to state of Beds—*continued.*

No. of License.	Substance of Reports received as to state of Beds.
	County Kerry—*continued.*
78	No replies received.
84	About 50,000 oysters which were scattered have been collected and beds cleaned since last report. 4,050 oysters sold since last report. 8,000 Irish oysters and 6,000 French have been laid down. Moderate fall of spat. Beds in good state, oysters large, fat, and well flavoured. French oysters so far have succeeded; about 100 died shortly after laying down, about half hundred since; they have passed through a very severe winter and are still healthy, but have not fattened or increased in size, although they do not seem so healthy as our native oysters. This is a fattening and breeding bed.
91, 92	A good deal of labour expended in cleaning the planted parts of vermin and dirt. A good many more than 5,000 native seed oysters laid down, and about 5,000 sold, off outlying portions. Not much fall of spat occurred. Considers bed improving. Finds vermin a great destruction to oysters in river.
125	Has laid down 120,000 oysters from Tralee oyster bed, and 50,000 French in prime condition, and has been carefully farming them since, and repairing any breaches in the concrete walls. Sold about 50,000 principally to English dealers, at about £5 per 1,000. Very little spatting, if any. Considers bed very flourishing. Calculates about 10 per cent. of the French oysters died in transit or soon after being laid down, the remainder appear to be doing well, and proposes laying down largely this coming season.
154	This license only granted in 1878.
155	This license only granted in 1878.
	County Clare.
28	No replies received.
34	Do.
80	Do.
	County Galway.
12	Nothing done since last report except to keep bed clean and free from trespass. No fall of spat observed. Has not tried French oysters.
15	No replies received.
17	Bed cleaned and oysters scattered since last report. None taken off or sold, but a quantity stolen. No oysters laid down. Spat observed to fall in well sheltered and sunny places, but none in open. Has not laid any French oysters down, as from what he sees on neighbouring beds they do not appear to be doing as anticipated. Remembers beds for 30 years and remarks a falling off in natural production and quantity of spat, nor are the oysters growing so quickly. Attributes this to imperfect knowledge held by breeders of Natural History of oyster.
18	2,000 more French oysters laid down. Only sufficient for home use and presents to friends taken off. Cannot form an estimate as to fall of spat beyond that it appeared a fair one. French oysters have to a certain extent succeeded, but the tide in the Killeries is so strong that, except in places sheltered by a little headland, they are for the most part swept away, but less so than the native oysters; and there is no way of sheltering the shore, which is exposed to all north-west winds.
19	No replies received.
23	Bed cleaned. 6,200 oysters sold. Found a good deal of spat on tiles previous to frost; thinks on an average 10 to each tile. Laid down 15,750 French oysters in April, which did well for some time, but many died during the frost. Will not sell oysters in 1879. Considers bed well stocked with brood.
27	No replies received.
33	Do.
37	Do.
44	Do.
46	Bed regularly cleaned and attended by a trained staff of men. Very few oysters taken off bed within last three years. 350,000 French oysters laid down. Spatting moderate. Beds in a satisfactory state. A considerable mortality in French oysters; considers them rather delicate for the Irish Coast. Had a good fall of spat in artificial pond, lately made, and the young oysters are doing well.
81	No replies received.
90	Do.
114	Beds cleaned since last report. 5,000 oysters sold. 20,000 French oysters laid down. Very small fall of spat. French oysters succeeded very well. This winter (1878) numbers died from the frost.
115	Nothing done to bed except removing grass, weeds, and mussels. No oysters sold. About 1,000 French laid down. Considers they are not as good as the native in regard to quality and flavour. Scarcely any spatting. Oysters fast disappearing from locality. Expects all the banks will be covered with mussels; they put in a strong appearance this year after 25 years absence.
128	See replies to License No. 23. No separate account kept.
130	Bed has been watched by two men, but satisfactory work cannot be done till a grant is obtained from Trustees of an Orphanage of a lease of shore opposite their land. About 24 oysters taken off since last season. None put down. No fall of spat.
146	Bed well cared. No oysters taken off. 20,000 French laid down; all appeared safe after transit. Cannot say as to spatting having taken place. Bed in a fair way at present. Hopes to be able to make a better report next season.
149	No replies received.
153	License only granted in 1878.
	County Mayo.
1	Merged into License No. 136, dated 5th July, 1875.
8	Nothing done since last report. No oysters sold; none put down; no spat. The French oysters laid down in former years all died.
11	No replies received.
13	Little or nothing done to beds since last report. No oysters sold and none laid down. Small fall of spat. Beds in good state.
21	No replies received.
22	Nothing except weeding done to bed since last report. 500 oysters sold; none laid down; very little fall of spat. Beds in good state. Fully approves of Colonel Hayes' Report on the French Oyster Fisheries; will give it a trial this season.
31	Nothing done since last report. No oysters taken off bed. Very little, if any, spat. Few oysters on bed; none laid down in 1878. Area comprised within bed being chiefly mud, oysters could not live in it, and what is fit for them is too small to go to any great expense in putting down oysters.
35	Nothing done to bed since last report. No oysters sold; none laid down; no fall of spat.
36	Same reply as No. 8.
47	The exceptional severity of the weather impeded, very seriously, operations of any sort on this bed. Now clearing mussels, &c. A considerable quantity of very fine oysters taken off for private use, but none sold. No French oysters laid down this season, but is in treaty for a supply, but the constant frost prevented arrangements being carried out; hopes to make the experiment early in the coming season. Not possible to obtain seed oysters anywhere on these coasts. There appeared to be a fair fall of spat, but a vast quantity is swept away by the force of the tides. Beds appear in a very healthy and flourishing condition, and have proved themselves a success in growing and fattening oysters of excellent quality and flavour. Considers promulgation of information as regards experiments with French brood oysters in this country would be satisfactory.
53	Nothing done to bed since last report, and nothing likely to be done till period for which Clew Bay is closed has elapsed.
54	Bed improved since last report. No oysters sold; about 600 for the use of the Archbishop of Tuam. No French oysters laid down. Laid down a large quantity of Irish oysters and spat.
64	Very little done since last report. No oysters taken off bed. Expects some French oysters, but has not yet received them. A very small fall of spat observed. Oysters planted have grown very large, but from exposed position of bed severe storms and currents affected them very much. Fears bed will never be good for breeding, but will fatten oysters in a short time. The drift sea-weed in stormy weather affects bed very much, lodging on anything placed to catch spat.
69	No replies received.

APPENDIX, No. 5.

APPENDIX,

LIST of LICENSES to Plant OYSTER BEDS *in force* on 31st December,

No. of License.	Date of License.	Persons to whom Granted.	Present Owner or Lessee.	Locality of Beds.	Area of Beds. A. R. P.	Average area of Beds available. Acres.
71	10th July, 1867,	Townsend Kirkwood,	Townsend Kirkwood,	Saleen Harbour,	17 0 0	14
116	25th May, 1872,	William Pike,	William Pike,	Achill Sound,	308 3 20	50
118	3rd July, 1872,	James Rowan,	James Rowan,	Do.,	43 3 0	2
126	1st December, 1873,	Benjamin Whitney,	James M'Donnell,	Blacksod Bay,	81 1 17	
136	5th July, 1875,	Thomas Shaen Carter,	H. T. Shaen Carter,	Trawmore Bay,	502 3 22	200
138	16th August, 1875,	John Kendall,	John Kendall,	Clew Bay,	44 0 37	10
137	9th December, 1875,	Denis Bingham,	Denis Bingham,	Blacksod Bay,	46 1 8	46
140	19th January, 1876,	Michael Moran,	Michael Moran,	Clew Bay,	3 2 2	3
144	14th September, 1876,	Maria Russell,	Maria Russell,	Do.,	4 1 10	4
147	27th December, 1876,	Francis Bournes,	Francis Bournes,	Elly Harbour,	83 2 6	
139	28th December, 1876,	Martin J. Fegan,	Martin J. Fegan,	Clew Bay,	12 3 9	10
141	Do.,	Francis Mulholland,	Francis Mulholland,	Do,	12 1 20	8
151	29th October, 1878,	William Pike,	William Pike,	Achill Sound,	1,676 0 0	
152	30th October, 1878,	Daniel Conway,	Daniel Conway,	Bellacragher Bay,	2 0 34	
	County Sligo.					
7	17th November, 1852,	Thomas White,	Percy H. Russ,	Ballisodare Bay,	132 1 26	10
49	13th April, 1865,	Sir Robert Gore Booth, bt.,	Sir Henry W. Gore Booth, bt.	Drumcliff Bay,	148 3 0	40
59	1st December, 1865,	Richard J. Verschoyle,	Richard J. Verschoyle,	Ballisodare Bay,	54 0 0	20
80	15th June, 1867,	Sir Robert Gore Booth, bt.,	Owen Rice,	Drumcliff Bay,	87 0 0	10
86	13th March, 1868,	Colonel Edward Cooper,	Colonel Edward Cooper,	Ballisodare Bay,	190 0 0	10
94	14th June, 1869,	John W. Stratford,	John W. Stratford,	Killala Bay,	31 0 0	
98	10th September, 1869,	Henry W. Meredith,	Henry W. Meredith,	Sligo Bay,	20 0 0	3
99	Do.,	Owen Wynne,	Owen Wynne,	Do.,	77 0 0	5
100	Do.,	Do.,	Do.,	Do.,	53 0 0	20
101	12th March, 1870,	R. J. Verschoyle,	R. J. Verschoyle,	Ballisodare Bay,	13 2 0	2
102	22nd April, 1871,	Agnes M. Nicholson,	W. K. Barrett,	Sligo Bay,	52 2 10	25
106	24th April, 1871,	Ed. Park,	Ed. Park,	Milk Haven.	22 0 0	2
107	Do.,	Martin Cunnawn,	Martin Cunnawn,	Do.,	2 2 10	1
108	Do.,	Michael Cunnawn,	Michael Cunnawn,	Do.,	2 1 10	1
121	24th February, 1873,	R. J. Verschoyle,	R. J. Verschoyle,	Ballisodare Bay,	114 0 20	9
122	3rd March, 1873,	Isabella Letitia Eccles,	Isabella Letitia Eccles,	Milk Haven,	29 1 3	2
135	27th January, 1875,	St. Geo. Jones Martin,	Thomas Gardiner,	Sligo Estuary or Bay,	77 1 33	35
	County Donegal.					
9	22nd September, 1853,	J. O. Woodhouse,	C. O. Woodhouse,	Mulroy Bay,	63 0 26	32
82	31st January, 1868,	William Hart,	The Lessees The Hon. The Irish Society.	Lough Swilly,	790 0 0	200
109	15th July, 1871,	Sir James Stewart, bart.,	Owen Rice,	Do.,	106 2 21	106
110	27th July, 1871,	F. Mansfield,	F. Mansfield,	Do.,	25 1 0	10
133	15th October, 1874,	Do.,	Do.,	Do.,	12 2 0	
148	31st March, 1877,	Alex. J. R. Stewart,	Alex. J. R. Stewart,	Sheephaven,	143 2 16	
156	30th November, 1878,	Jane Moore Doherty,	Jane Moore Doherty,	Lough Foyle,	31 2 28	
	Co. Londonderry.					
142	6th July, 1876,	The Lessees The Hon. The Irish Society.	The Lessees The Hon. The Irish Society.	Lough Foyle,	3,270 2 24	100
	County Down.					
112	9th October, 1871,	Marquess of Downshire,	Marquess of Downshire,	Dundrum Bay,	32 0 2	10
131	14th September, 1874,	Samuel Murland,	Samuel Murland,	Strangford Lough,	15 3 28	15

No. 5—*continued.*

1878, and Substance of Reports received as to state of Beds—*continued.*

No. of License.	Substance of Reports received as to state of Beds.
	County Mayo—*continued.*
71	Bed carefully preserved. Overplus of oysters collected and placed on bed. No oysters taken off. About 960 native oysters laid down. A reasonable amount of spatting since last report. Bed very promising, would not lay down foreign seed as enough native found on bed. Considers bed will amply repay for outlay.
116	No replies received.
118	Nothing done since last report except oysters occasionally turned. None taken off the beds and none laid down. Much spat did not appear, but could not be seen owing to drifting of sand. Beds in a good state, but drifting of sand does great injury.
126	
136	Bed carefully preserved, no oysters taken off. A fair fall of spat. Bed undoubtedly in good order. No oysters laid down.
138	No replies received.
137	Bed in a very good state. Some native oysters laid down, but cannot state exact quantity.
140	Bed cleaned and raked. No oysters taken off. Could have sold some only for By-law prohibiting the removal of same. Very little spat observed. Beds in a fair state. No French oysters laid down.
144	Bed cleaned since last report. No oysters sold and 6,000 laid down. Good fall of spat. Beds in good state. No French oysters put down.
147	Breeding oysters cured. No oysters taken off bed, none laid down. A large fall of spat this year. Beds very progressive.
139	
141	Bed has been kept clean by dredging since last report. No oysters sold, none put down. Fair show of spat.
151	Oysters redistributed. No oysters sold, a small quantity laid down. Some spat seen.
152	Oysters distributed on bed, which was cleaned of moss since last report. No oysters sold. Some oysters laid down. Fair amount of spat has been seen, but the frost killed a good deal. Beds are improving.
	County Sligo.
7	Bed dredged and cleaned of mussels, &c. About 100,000 French and Irish and 60,000 American oysters taken off the bed, 150,000 French and 100,000 Americans laid down, and 150,000 French and 300,000 Americans more to arrive in a fortnight. No spatting whatever. Bed in good working order, but not sufficiently stocked. French oysters have succeeded very well; very slight loss either in transit or on the beds. The American oyster trade with him likely to become a very large one, part of the bed suiting them admirably. The great disadvantage, however, is not being allowed to send them to England during August, when American oysters bring the highest price.
19	Bed cleaned. 15,000 oysters taken off; about 11,600 oysters laid down. A moderate fall of spat in one part of bed (rocky ground), better than has been for four or five years. French oysters succeeded well, when not injured in transit or not choked by sand; the shell is thin and delicate and easily injured. The running sand which chokes such a number of oysters is principally caused by the digging of slugs adjacent to the bed for baits for fishery purposes. Some of the men state that trawling outside on the bank increases the evil. It is feared this moving sand will eventually destroy the bed, as it did formerly to old Lessadill Bed.
59	Bed has been cleaned since last report and a quantity of rocks removed and used to form paved beds on which young oysters are placed. Sold about 75,000 oysters since last report; laid down about 23,000 French oysters. There is no sign of spat. Beds are improving. The French oysters purchased previous to this season have done badly, did not grow, and heavy loss by deaths. They were small oysters of 2 years; is now trying a larger and older lot, intending only to hold them for a few months. Has not seen or heard of any spat in Ballisodare Bay since last season. None on his breeding ponds. Spat which was obtained in 1877 is doing well, and came through winter with comparatively little loss.
80	No replies received.
86	Bed picked and kept clean from mussels and dog-wilks. No oysters sold. A few thousand American oysters laid down; intend laying down more. No French oysters put down; found one-third of those put down died in transit, or were injured in the shell. Believes they are too young and delicate for transit, the shell being so easily broken; the American ones seem to be stronger and healthier and more likely to spat than the French. No spatting. Bed pretty well stocked.
94	No replies received.
97	Do.
99	Considered it best not to do anything in 1878 except to protect bed. No oysters dredged even for private use.
100	Same as reply to Licence No. 99.
101	See replies to 59 which apply equally to this.
102	Oyster shells and gravel have been put on bed since last report. Between 6,000 and 7,000 oysters sold. 15,000 French oysters and a few thousand Irish laid down. Very little spat. Beds the same since last report. A great number of French oysters died in transit. Those on bed have done well but do not grow to a large size. The bed does not dry at low tide as formerly. Has not been able to gather only to dredge.
106	Scarcely any change in bed since last report. Sold about £5 worth of oysters. French oysters all died. Don't consider last season was good for spatting.
107	Did all he could with bed, put down all the oysters he could but they did no good, owing to being covered by sand and the great frost and snow. No oysters taken off bed. Spat and French oysters all killed by frost. Considers bed good and would be sorry to part with it.
108	Similar replies as to license, No. 107.
121	See replies to 59, which apply equally to this.
122	Nothing done to bed since last report. About 500 oysters sold. State of bed at present very poor. No oysters laid down. Owing to change in Grange River sand comes in over bed and very little spat can be caught owing to the very strong current.
135	No replies received.
	County Donegal.
9	Beds not interfered with, pending result of experiments with French oysters, on beds in Carlingford Lough—Licenses, Nos. 57 and 65.
82	Oysters that were on this bed have all been lifted and taken to Lough Foyle, and license may be cancelled.
109	No replies received.
110	Quantity of vermin and other matter injurious to oysters removed since last report. 49,000 oysters sold, 2,850 laid down. Little or no spat. Large quantity of oysters killed by frost. No French oysters laid down.
133	Replies to license, No. 110, refer equally to this bed.
148	A caretaker appointed to preserve bed. A quantity of oysters were stolen. A good natural fall of spat. State of bed as previously. No oysters laid down.
156	License only granted in 1878.
	County Londonderry.
142	Beds carefully watched. Some mussels lifted and shipped to Scotland for bait. Only a few oysters lifted, but none sold. A small quantity of spat observed. The oysters laid down appear to be growing and getting into better condition, particularly those brought from Lough Swilly. About 44,000 French oysters purchased in Bordeaux, and laid down in 1877, and it is the intention of the lessees to lay down some more in next March and April, as it is considered those laid down have done very well. They have increased in size very considerably, and also in condition, it is intended to sell some this season. Very few French oysters died in transit or appear to have been lost on the beds.
	County Down.
112	Embankments kept up, large stakes taken up and smaller ones put down. No oysters taken off bed. Some young oysters found in enclosure at Ballykinlar. Beds in pretty good state except the Murlough Bridge Pond where mud accumulated. No oysters laid down. Intends laying down French oysters, and an additional enclosure has been made between the railway and the street of Dundrum village, and it seems probable that successful spatting might take place at Ballykinlar, the difficulty being to retain the fish in the pond, and the sand is a great detriment. The trustees of Lord Downshire have allowed a further small sum towards promoting the object in 1879.
131	Nothing done since last report. The oysters that were laid down died. Next spring intends seeing what can be done.

APPENDIX. Nos. 5, 6 7, 8, 9, 10.

APPENDIX,

LIST of LICENSES to Plant OYSTER BEDS *in force* on 31st December,

No. of License.	Date of License.	Persons to whom Granted.	Present Owner or Lessee.	Locality of Beds.	Area of Beds.	Average area of Beds available.
	County Louth.				A. R. P.	Acres.
10	1st July, 1854,	Burton Bindon,	Lord Clermont,	Carlingford Lough,	51 3 10	
57	1st December, 1865,	John Obins Woodhouse,	C. O. Woodhouse,	Do.,	54 0 0	50
65	4th June, 1866,	Do.,	Do.,	Do.,	96 0 0	
97	10th September, 1869,	Lord Clermont,	Lord Clermont,	Do,	54 0 0	
111	1st July, 1871,	Arthur Hamill, Q.C.,	Arthur Hamill, Q.C.,	Do.,	144 0 0	
				Total,		

APPENDIX, No. 6.

HERRING FISHERY, 1878.

	Boats employed, and highest number on any one day.				Total Capture.	Average Price.	Value.
	English.	Scotch.	Irish.	Manx.			
					Mease.	£ s. d.	£
Howth, between 24th May and 7th Dec., 1878,	210	215	350	210	68,060	1 3 8	80,694
Arklow, between 9th June and 15th Dec., 1878.	–	–	91	–	6,359	0 16 8	5,285
Kinsale, between 29th April and 21st Dec., 1878,	–	20	22	8	1,372	1 17 5	2,569
Greenore, between 4th June and 27th Nov., 1878,	–	5	45	11	46,754	1 3 8	55,155
Ardglass, between 25th May and 7th Dec., 1878,	40	152	79	37	58,335	1 1 10	63,830
Omeath and Warrenpoint, between 4th June and 19th Oct., 1878,	–	15	50	105	455	1 4 0	546
Kilkeel, between 1st June and 1st Nov., 1878,	200	43	75	–	1,300	1 5 0	1,625
Annalong,	–	–	35	–	9,000	1 0 0	9.000
Courtown,	–	–	35	–	1,968	0 16 0	1,574
					193,603	1 2 9	220,278

APPENDIX No. 7.

MACKEREL FISHERY, 1878.

	Boats employed, and highest number on any one day.		Total Capture.	Average Price.	Amount realized.
			Boxes.	£ s. d.	£
Kinsale,	Irish,	197	92,626	1 1 1	97,783
	Scotch,	20			
	Manx,	224			
	English,	38			

APPENDIX, No. 8.

SUMMARY of the quantity of HERRINGS, MACKEREL, and COD, exported to undermentioned places in England, consigned from Irish Fisheries, from 1st January to 31st December, 1878.

	Herrings. No. of Boxes of 2 cwt. each.	Mackerel. No. of Boxes of 2 cwt. each.	Cod. No of Boxes of 2 cwt. each.		Herrings. No. of Boxes of 2 cwt. each.	Mackerel. No. of Boxes of 2 cwt. each.	Cod. No. of Boxes of 2 cwt. each.
London,	33,674	28,573	12,670	Liverpool,	24,112	13,678	10,670
Nottingham,	3,599	2,842	4,725	Birmingham,	11,985	4,321	4,620
Bradford,	17,820	3,777	3,849				
Manchester,	8,077	10,665	10,762	Total, 1878,	120,906	80,299	55,546
Sheffield,	7,554	5,321	1,333	,, 1877,	122,224	83,029	57,839
Wolverhampton,	6,121	6,217	3,697				
Leeds,	7,961	4,906	3,220	Decrease,	1,318	2,730	2,293

	£	s.	d.
Computing the Herrings at £2 per box,	241,812	0	0
,, the Mackerel, 92,626 boxes, at 21*s.* 1*d.* per box,*	97,788	0	0
,, the Cod at £3 per box,	166,638	0	0
Total value,	£506,238	0	0

* The only return received was relative to the above-mentioned places, but there were 92,626 boxes captured at Kinsale, the great bulk of which was exported.

No. 5—*continued.*

1878, and Substance of Reports received as to state of Beds—*continued.*

No. of License.	Substance of Reports received as to state of Beds.
	County Louth.
10	Nothing done to bed since last report. 46,000 oysters sold in 1878. Did not ascertain if spat had fallen. Beds in a promising state.
57	Several large ponds with sluice gates made. Several thousand oysters taken off for sale or private use. Some spat fell. Bed in fair working order. About 200,000 French oysters laid down, which have succeeded very well, but owing to the severe and continued frost, about 3 per cent. were lost during the winter.
65	For replies see license, No. 57, which with this form one bed.
97	Nothing done since last report. 4,600 oysters sold, none laid down. Beds reported to be in a healthy state.
111	No replies received.

APPENDIX, No. 9.

TABLE showing Loans applied for and advanced under the Irish Reproductive Loan Fund Act during the Year 1878.

COUNTY.	Amount available in 1878.	No. of Applications.	No. of Applicants.	Amount of Loans applied for in 1878.	No. of Loans recommended.	No. of Persons to whom Loans recommended.	Amount of Loans recommended in 1878.	No. of Loans actually issued.	Amount of Loans actually issued in 1878.	Loans cancelled or not perfected.		Instalments of Loans not taken up.		Loans recalled for misapplication.	
										No.	Amount.	No.	Amount.	No.	Amount.
	£ s. d.			£ s. d.			£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.
Cork,	859 0 0	58	75	1,872 10 0	17	21	874 0 0	16	859 0 0	1	15 0 0	–	—	–	—
Kerry,	2,450 0 0	152	204	3,832 12 0	100	136	2,467 0 0	91	2,304 0 0	9	163 0 0	–	—	3	72 0 0
Leitrim,	332 0 0	1	1	10 0 0	1	1	10 0 0	–	—	1	10 0 0	–	—	–	—
Limerick,	625 0 0	1	1	6 0 0	–	–	—	–	—	–	—	–	—	–	—
Galway,	1,077 0 0	188	401	3,667 19 0	87	144	1,058 10 0	80	929 10 0	7	80 0 0	7	49 0 0	–	—
Sligo,	449 0 0	32	41	551 12 6	19	27	275 0 0	19	267 0 0	–	—	1	8 0 0	1	24 0 0
Mayo,	606 0 0	88	168	1,373 0 6	51	94	622 0 0	49	558 0 0	2	28 0 0	6	36 0 0	–	—
Clare,	343 0 0	38	55	495 0 0	25	34	282 0 0	24	270 0 0	1	12 0 0	–	—	–	—
Total,	6,741 0 0	558	946	11,808 14 0	300	457	5,588 10 0	279	5,187 10 0	21	308 0 0	14	93 0 0	4	96 0 0

APPENDIX No. 10.

Table showing Total Amounts advanced on Loan, and the Total Repayments since the passing of Act to 31st December, 1878.

COUNTY.	Issued in 1875.	Issued in 1876.	Issued in 1877.	Issued in 1878.	Total Amounts Issued to 31st December, 1878.	Total Repayments to 31st December, 1878.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Cork,	1,060 0 0	920 0 0	867 0 0	859 0 0	3,706 0 0	2,360 17 10
Kerry,	2,315 0 0	1,218 0 0	114 0 0	2,304 0 0	5,951 0 0	3,196 9 7
Leitrim,	50 0 0	30 0 0	—	—	80 0 0	43 3 0
Limerick,	—	—	—	—	—	—
Galway,	1,162 0 0	1,144 0 0	1,100 0 0	929 10 0	4,335 10 0	2,558 19 7
Sligo,	482 0 0	124 0 0	205 0 0	267 0 0	1,078 0 0	565 10 11
Mayo,	754 0 0	707 0 0	617 0 0	558 0 0	2,636 0 0	1,383 2 2
Clare,	317 0 0	369 0 0	364 0 0	270 0 0	1,320 0 0	668 0 5
Totals,	6,140 0 0	4,512 0 0	3,267 0 0	5,187 10 0	19,106 10 0	10,776 3 6

Appendix, No. 11.

Schedule of Licence Duties received by the Boards of Conservators for the Year 1878.

District.	Number and Description of Licences sold in 1877.																1878. Amount of Licence Duty.	1878. Per-centage on Poor Law Valuation.	1878. Amount received for Fines, Sale of Forfeited Engines, Interest on Bank Account.	1878. Amount of Subscriptions received.	1878. Total Amount received.	1878. Average No. employed.
	1. Salmon Rods.	2. Cross Lines.	3. Snap Nets.	4. Draft Nets.	5. Drift Nets.	6. Trammel Nets, for Pollen.	7. Pole Nets.	8. Bag Nets.	9. Fly Nets.	10. Stake Nets.	11. Head Weirs.	12. Box, Crib, &c.	13. Gap, Eye, &c.	14. Sweepers.	15. Coghills.	16. Loop Nets.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
1. Dublin,	97	1	–	16	–	–	–	–	–	–	–	–	–	–	–	–	147 0 0	—	4 4 10	—	151 4 10	189
2. Wexford,	89	–	–	54	–	–	–	–	–	–	–	–	–	–	–	–	245 0 0	—	39 4 5	—	284 4 5	407
3. Waterford,	218	14	244	29	90	–	–	–	–	4	–	3	22	–	–	–	1,141 0 0	—	118 1 10	—	1,259 1 10	2,305
4. Lismore,	253	6	25	11	106	–	1	1	–	2	–	2	–	–	–	–	745 10 0	68 0 0	63 0 7	—	876 10 7	975
5. Cork,	283	3	–	73	4	–	–	1	–	1	–	–	–	–	–	–	560 0 0	—	62 0 7	—	622 0 7	755
6¹. Skibbereen,	11	–	–	15	–	–	–	–	–	–	–	–	–	–	–	–	56 0 0	—	2 14 0	—	58 14 0	101
6². Bantry,	13	–	–	12	–	–	–	–	–	–	–	–	–	–	–	–	49 0 0	—	4 13 6	—	53 13 6	85
6³. Kenmare,	22	–	–	7	–	–	–	1	–	–	–	–	–	5	–	–	57 10 0	6 0 0	—	—	63 10 0	98
7. Killarney,	102	4	–	64	–	–	–	–	–	–	–	2	–	–	–	–	322 0 0	27 8 0	73 10 0	19 9 0	442 7 0	495
8. Limerick,	271	43	31	73	137	–	17	–	–	33	1	9	133	–	–	–	2,254 5 0	2 0 0	157 16 0	—	2,414 1 5	2,048
9. Galway,	147	9	–	12	–	6	–	–	–	–	–	4	21	–	–	–	271 0 0	45 0 0	14 10 0	—	330 10 0	293
10¹. Ballynakill,	53	–	–	17	1	–	2	–	–	–	–	–	–	–	–	–	111 0 0	—	2 0 0	32 10 0	145 10 0	166
10². Bangor,	27	–	–	26	–	–	–	12	–	–	–	–	–	–	–	–	225 0 0	5 0 0	1 6 4	—	231 6 4	231
11. Ballina,	75	–	–	40	51	–	–	5	–	–	–	7	13	–	–	–	451 0 0	—	23 5 6	15 0 0	489 5 6	568
12. Sligo,	14	1	–	19	–	–	–	1	–	–	–	–	4	–	–	–	87 0 0	—	0 13 4	20 0 0	107 13 4	142
13. Ballyshannon,	112	13	–	45	–	–	3	–	–	1	–	4	29	–	–	–	378 0 0	5 0 0	19 6 8	168 2 0	570 8 8	481
14. Letterkenny,	46	–	–	16	13	–	–	3	–	–	–	1	–	–	–	6	179 0 0	14 0 0	5 14 10	—	198 14 10	226
15¹. Londonderry,	77	6	–	32	44	–	2	4	–	3	–	–	–	–	–	–	451 0 0	95 0 0	46 18 3	605 0 0	1,197 18 3	535
15². Coleraine,	91	–	–	135	–	108	–	2	–	–	–	4	–	–	52	–	820 0 0	219 0 0	149 6 9	—	1,179 6 9	1,079
16. Ballycastle,	22	–	–	11	–	–	–	14	–	–	–	–	–	–	–	–	195 0 0	60 0 0	32 11 3	—	287 11 3	144
17¹. Drogheda,	66	5	6	61	–	–	–	–	–	–	–	5	–	–	44	–	362 0 0	—	1 6 8	—	363 6 8	512
17². Dundalk,	47	–	–	25	–	–	–	2	–	–	1	–	35	–	–	–	183 0 0	8 0 0	42 15 6	5 10 0	239 5 6	273
Total,	2130	105	306	793	446	114	25	46	–	44	2	41	257	5	96	6	9,290 5 0	545 8 0	865 1 3	865 11 0	11,566 5 3	12,108

The estimate of the average number of men employed is made up as follows:—

Salmon Rods, . . 1 man.	Drift Nets, . . 5 men.	Fly Nets, . . . 4 men.	Gap, Eye, &c. . . 2 men.
Cross Lines, . . 2 men.	Trammel Nets, . . 2 do.	Stake Nets, . . . 4 do.	Sweepers, . . . 6 do.
Snap Nets, . . 4 do.	Pole Nets, . . . 3 do.	Head weirs, . . . 1 man.	Coghills, . . . 1 man.
Draft Nets, . . 6 do.	Bag Nets, . . . 4 do.	Box, crib, &c. (every 5) 2 men.	Loop or Frame Nets, . 1 do

Appendix, No. 12.

Table showing the Total Amount received in the various Fishery Districts from the sale of Licences between the years 1863 and 1878, inclusive.

	Amount received for Licence Duty. £ s. d.		Amount received for Licence Duty. £ s. d.		Amount received for Licence Duty. £ s. d.
1863 . . .	5,892 7 6	1869 . . .	6,700 6 4	1874 . . .	9,418 9 0
1864 . . .	6,841 5 0	1870 . . .	7,511 13 4	1875 . . .	9,417 1 8
1865 . . .	6,722 16 8	1871 . . .	8,865 15 9	1876 . . .	9,678 5 10
1866 . . .	7,098 6 8	1872 . . .	8,998 1 0	1877 . . .	9,760 15 0
1867 . . .	7,317 0 0	1873 . . .	9,040 14 0	1878 . . .	9,735 13 0
1868 . . .	7,033 10 6				

Increase in Licence Duty since 1863, £3,843 5s. 6d.

Appendix, No. 13.

Schedule of License Duties payable in each District on Engines used for Fishing for Salmon, January, 1879.

District.	1. Salmon Rods.	2. Cross Lines.	3. Snap Nets.	4. Draft Nets.	5. Drift Nets.	6. Trammel Nets for Pollen.	7. Pole Nets.	8. Bag Nets.	9. Fly Nets.	10. Stake Nets.	11. Head Weirs.	12. Box, Crib, &c.	13. Gap, Eye, &c.	14. Sweepers.	15. Coghills.	16. Loop Nets.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1. Dublin,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
2. Wexford,	1 0 0	1 0 0	0 15 0	3 0 0	1 10 0	0 15 0	1 0 0						0 10 0	—	—	—
3. Waterford,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
4. Lismore,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
5. Cork,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
6[1]. Skibbereen,	1 0 0	1 0 0	0 15 0	3 0 0	3 0 0	0 15 0	1 0 0						0 10 0	—	—	—
6[2]. Bantry,	1 0 0	1 0 0	0 15 0	3 0 0	3 0 0	0 15 0	1 0 0						0 10 0	—	—	—
6[3]. Kenmare,	1 0 0	1 0 0	0 15 0	1 10 0	1 10 0	0 15 0	1 0 0						0 10 0	3 0 0	1 10 0	—
7. Killarney,	1 0 0	2 0 0	1 0 0	3 0 0	3 0 0	0 15 0	1 0 0						0 10 0	—	—	—
8. Limerick,	1 0 0	1 5 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
9. Galway,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
10[1]. Ballynakill,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0	10 0 0	30 0 0	30 0 0	6 0 0	10 0 0	1 0 0	—	—	—
10[2]. Bangor,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
11. Ballina,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
12. Sligo,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
13. Ballyshannon,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	1 0 0	—
14. Letterkenny,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						0 10 0	—	1 0 0	1 0 0
15[1]. Londonderry,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
15[2]. Coleraine,	1 0 0	2 0 0	0 15 0	3 0 0	3 0 0	1 0 0	2 0 0						1 0 0	—	3 0 0	—
16. Ballycastle,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	1 10 0	2 0 0						1 0 0	—	—	—
17[1]. Drogheda,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	0 15 0	2 0 0						1 0 0	—	1 0 0	0 10 0
17[2]. Dundalk,	1 0 0	2 0 0	1 10 0	3 0 0	3 0 0	0 15 0	2 0 0						1 0 0	—	1 0 0	—

APPENDIX, No. 14.

Abstract of By-Laws, Orders, &c.

APPENDIX, No. 14.

ABSTRACT of BY-LAWS, ORDERS, &c., in force on 1st January, 1879, relating to the SALMON FISHERIES of IRELAND.

Place affected by By-Law, and Date thereof.	Nature of By-Law.
	SALMON AND TROUT.
	Dublin District.
River Liffey, (19th Jan., 1865.)	Prohibiting the catching, or attempting to catch, Salmon with any Net of greater length than 350 yards, in that part of the River Liffey which is situated between the Weir known as the Island Bridge Weir and a line drawn due North from Poolbeg Lighthouse.
Between Dalkey Island and Wicklow Head. (15th Oct., 1874.)	Permitting use of Nets with Meshes of one inch from knot to knot for capture of Salmon or Trout between Dalkey Island and Wicklow Head.
	Wexford District.
River Slaney, (25th March, 1854, and 4th March, 1862.)	Prohibiting, during the Close Season for Salmon, the use of Nets of any kind whatsoever, between Ferrycarrig Bridge and the Town of Enniscorthy.
	Prohibiting, during the Open Season for Salmon, the use of Nets with meshes of less size than one and three-quarter inches from knot to knot, between Ferrycarrig Bridge and the Town of Enniscorthy.
Derry Water and River Derry. (26th Oct., 1870.)	Permitting use of Nets for the capture of Fish, having Meshes of one inch from knot to knot (to be measured along the side of the square, or four inches, to be measured all round each such Mesh, such measurements being taken in the clear when the Net is wet), in the rivers and streams following, that is to say, in the Derry Water, from its source near Killaveney to Annacurragh Bridge, with the stream flowing into same from Moyne Church through Ballinglen, and the Tomnaskela River; and in the Greenisland, Shillelagh, and Derry River, from the bounds of the County Carlow, flowing past Tinnahely by Shillelagh to the bounds of the County Wexford, with the small streams flowing into that portion of the said river, all said rivers and streams being in the County Wicklow, for and during the months of May, June, July, and August, in each year.
Potter River, (26th Oct., 1870.)	Permitting use of Nets for the capture of Fish with Meshes of one inch from knot to knot (to be measured along the side of the square, or four inches to be measured all round each such Mesh, such measurements being taken in the clear, when the Net is wet), in the tidal portion of the Potter River, situated below Brittas Bridge in the County of Wicklow.
Owenavorragh River, (15th Feb., 1875.)	Permitting use of nets with meshes of one inch from knot to knot for capture of salmon or trout.
	Waterford District.
Bessborough Demesne, Co. Kilkenny. (5th May, 1866.)	Permitting the use of Nets for the capture of Fish with Meshes of one inch from knot to knot (to be measured along the side of the square, or four inches to be measured all round each such Mesh, such measurements being taken in the clear, when the Net is wet,) within the Waters in, and Rivers running through the Demesne of Bessborough, in the County of Kilkenny: Provided that no Net having a less Mesh than one inch and three-quarters from knot to knot, shall be used in the said Rivers during the Months of April, May, and June.
Corrock River, (7th July, 1870.)	Permitting use of Nets with Meshes of one inch from knot to knot (to be measured along the side of the square, or four inches to be measured all round such Mesh, such measurements being taken in the clear when the Net is wet).
River Suir, (17th Aug., 1875.)	Prohibiting use of all Engines (save single Rods and Lines) for capture of Fish, between the Bridges at Suir Island and a line drawn due south across the River, and intersecting said Island at Clonmel.
River Suir, Nore, and Barrow, conjoined. (14th March, 1878.)	Prohibiting to use for the capture of Salmon or Trout any Drift Net in the Tidal portions of the River Suir, Nore, and Barrow, above a line drawn across said River from Cheek point, County Waterford on the West, in an Easterly direction to Canpile Pill, in the County Wexford.
Between Helvick Head and Ballycotton, River Blackwater, &c. (6th Nov., 1874.)	**Lismore District.** Repealing By-law of 2nd November, 1870, regulating Drift Net Fishing, and in lieu thereof providing as follows:— First.—That no Drift Nets of greater length than 200 yards shall be used for the capture of Salmon and Trout in the Rivers or Estuaries flowing into the sea between Helvick Head and Ballycotton, or in the sea between those points. Second.—That no two or more Drift Nets when fishing shall be attached together in any way. Third.—That Drift Nets shall not be used at a less distance from each other than fifty yards in that portion of the River Blackwater situated within one mile of the mouth of the River as at present defined, each Drift Net shot and drifting to be kept at a distance of not less than fifty yards from the one preceding it on the tide and already drifting.
River Blackwater. (14th March, 1878.)	Prohibiting to use for the capture of Salmon or Trout any Drift Net in the Tidal portion of the River Blackwater, or its Tributaries, above or to the Northward of a line drawn across said River from the Townland Boundary between the Townlands of Strancally and Newport East on the West, to the Townland Boundary between the Townlands of Coolbagh and Ballynaclash on the East, all in the County of Waterford.
	Cork District.
Tidal Waters, (11th Sept., 1866.)	Prohibiting the catching or attempting to catch Salmon or Trout in any Tidal Water in the Cork District with a Spear, Lyster, Otter, Strokehaul, Dree Draw, or Gaff, except when the latter instrument may be used solely as auxiliary to angling with Rod and Line, or for the purpose of removing Fish from any legal Weir or Box by the Owner or Occupier thereof. Prohibiting the snatching or attempting to snatch Salmon or Trout in any Tidal or Fresh Water in the Cork District with any kind of Fish-hook, covered in part or in whole with any matter or thing, or uncovered.
River Lee, Co. of the City of Cork. (7th January, 1863.)	Prohibiting, during the Close Season for Salmon the use of Draft Nets, or any other Net or Nets used as a Draft Net, having a foot-rope and leads or weights affixed thereto, within the following limits, viz.:—in that part of the River Lee, situate between Patrick's Bridge, in the City of Cork, and a line drawn across the said River Lee, from Blackrock Castle, on the south, to the Western extremity of the Townland of Dunkettle, on the North.
River Lee, (21st April, 1871.)	Prohibiting use of all Nets, except Landing-Nets, as auxiliary to rods and lines in part of South Channel between George IV. Bridge and Friar's Weir.
River Lee, (31st March, 1876.)	Prohibiting the catching or attempting to catch Fish of any kind in that part of the River Lee situated between the Cork Waterworks Weir and St. Vincent's Bridge in the North Channel, and Clarke's Bridge in the South Channel, and in the mill races and inlets from such channels with a Spear, Lyster, Otter, Strokehaul, Dree-draw or Gaff, except when the latter instrument may be used solely as auxiliary to angling with Rod and Line, or for the purpose of removing Fish from any legal Weir or Box by the owner or occupier thereof.
River Lee & Rivers running into Cork Harbour. (16th Feb., 1877.)	Prohibiting the use of Drift Nets for Salmon or Trout in any Tidal Waters inside or to north of a line from Lighthouse at Roche's Point to mainland on the West.
Ditto, (26th Sept., 1878.)	Prohibiting to use any Net for the capture of Salmon or Trout in any Tidal Water, inside or to North of a line from Lighthouse at Roche's Point to Mainland on the Wests having Meshes of greater dimensions than two and one-half inches from knot to knot, to be measured along the side of the square, or ten inches to be measured all round each such Mesh, such measurements being taken in the clear when the Net is wet.
River Lee, (29th Sept., 1877.)	Prohibiting having Nets for capture of Salmon or Trout on board any Boat, Cot, or Curragh in that part of River seaward of a line drawn due south from the Western end of Myrtle

APPENDIX, No. 14—*continued.*

ABSTRACT of BY-LAWS, ORDERS, &c., in force on 1st January, 1879, relating to the SALMON FISHERIES of IRELAND.

Place affected by By-Law, and Date thereof.	Nature of By-Law.
	Cork District—*continued.*
River Lee—*continued.*	Hill-terrace on the north, near a place known as the Brick Fields, to the opposite shore, or in the tidal part of any river flowing into River Lee, between 8 o'clock on Saturday morning and 6 o'clock on Monday morning; or in that part of said River between the line mentioned above and the point of the Custom House in the City of Cork between 8 o'clock on Saturday morning and half-past 5 o'clock on Monday morning; or in the North Channel of said River between Northgate Bridge and Wellington Bridge, or in the South Channels between the slip at Danzey Bridge opposite Keyser's Hill, leading to Crosse's Green and St. Fin Barr's Quay, and the Bridge where the Western Road crosses South Channel, between 6 o'clock on Saturday morning and 6 o'clock on Monday morning.
Argideen River, (24th Feb., 1860.)	Prohibiting the use of Nets of any kind whatsoever in the tidal part of the river known as the Argideen River, in the County of Cork, situated between the junction of the Owenkeagh or Blind River with the said Argideen River and the Bridge of Timoleague, all in the Barony of the East Division of East Carbery, and County of Cork.
Argideen River, (16th Feb., 1877.)	Prohibiting the use of Drift Nets for Salmon or Trout in Tidal Waters inside a line rom Land Point in an easterly direction to the opposite shore.
Bandon River, (10th Dec., 1874.)	Prohibiting for five years from the 1st January, 1875, the use of all Nets (except Landing Nets as auxiliary to angling with Rod and Line) for the capture of Salmon or Trout in any part of said River or its Tributaries, above a line drawn across the said River at right angles with the River's course from the Stream on the east side of said River, dividing the Townlands of Coolmoreen and Skeamogue to the Stream on the opposite shore dividing the Townlands of Drumkeen and Knockroe.
Bandon River, (16th Feb., 1877.)	Prohibiting the use of Drift Nets for Salmon or Trout in Tidal Waters inside a line from Stookeen Point in an easterly direction to Preghane Point.
	Skibbereen District.
River Ilen, (28th Feb., 1874.)	Permitting use of Nets with Meshes of one and a quarter inches from knot to knot for capture of Salmon or Trout.
	Bantry District.
Tidal Waters, (7th March, 1870.)	Permitting use of Nets of a Mesh of one and a quarter inches from knot to knot (to be measured along the side of the square, or five inches to be measured all round each such Mesh, such measurements being taken in the clear when the Net is wet), in the tidal waters of the Bantry District, which comprises the whole of the sea along the coast between Mizen Head in the County Cork and Crow Head in the same County, and around any Islands or Rocks situate off same, with the whole of the Tideways along said Coast and Rivers, and the whole of the tidal portions of the several Rivers and their Tributaries flowing into said Coast.
Snave or Coomhola, Mealagh, or Dunnamark, Owvane, and Carrigboy Rivers. (21st June, 1871.)	Prohibiting use of all Nets, save Landing-Nets, as auxiliary to rods and lines in fresh-water portions of said Rivers.
	Killarney District.
Castlemaine Estuary (27th Oct., 1858.)	Prohibiting, during the Salmon Close Season, the use of Draft Nets having a foot-rope and leads or weights affixed thereto, in the Estuary of Castlemaine inside the Bar of Inch.
Tidal Waters, (8th Feb., 1865.)	Prohibiting the catching, or attempting to catch Salmon in any tidal water with a Spear, Lyster, Otter, Strokehaul, Dree-Draw, or Gaff, except when the latter instrument may be used solely as auxiliary to angling with rod and line, or for the purpose of removing fish from any legal Weir or Box by the owner or occupier thereof.
Currane or Waterville River—Waterville Weir. (7th March, 1870.)	Permitting the space between the Bars or Rails of the Inscales, and of the Heck or upstream side of the Boxes or Cribs of the Waterville Weir to be one and a quarter inches apart.
Waterville River. (18th Feb., 1871.)	Prohibiting use of Nets between Waterville Weir and mouth of River as defined, between twelve o'clock noon on Friday and six o'clock on Saturday morning, and between six o'clock Monday morning and twelve o'clock noon same day in each week during Open Season.
	Limerick District.
River Shannon, Island Point. (5th Feb., 1856.)	Prohibiting Net Fishing in that part of the River Shannon between Wellesley Bridge and the Railway Bridge, between 1st June and 12th February.
River Shannon, (22nd Nov., 1862.)	Prohibiting Draft Nets for the capture of Fish of any kind, of a mesh less than one and three-quarter inches from knot to knot, to be measured along the side of the square, or seven inches to be measured all round each such mesh, such measurements being taken in the clear when the Net is wet, in the tidal parts of the River Shannon, or in the tidal parts of any of the Rivers flowing into the said River Shannon.
River Shannon, (5th May, 1866.)	Prohibiting the Fishing for Salmon or Trout by any means whatsoever, within a space of Twenty Yards from the Weir Wall of Tarmonbarry, on the River Shannon.
Rivers Shannon and Maigue. (5th June, 1867.)	Prohibiting the Shooting of Fish in that part of River Shannon between Portumna Bridge and Shannon Bridge, and also in River Maigue.
River Shannon, (1st March, 1872.)	Prohibiting having Nets for capture of Salmon or Trout on board any Cot or Curragh between mouth of Shannon and Wellesley Bridge, in the city of Limerick, or in tidal parts of any rivers flowing into the said River Shannon between said points between the hours of Nine o'clock on Saturday morning and Three o'clock on Monday morning; or between Wellesley Bridge and the Navigation Weir at Killaloe, in the County of Clare, between Eight o'clock on Saturday morning and Four o'clock on Monday morning.
Rivers Shannon, Maigue, and Askeaton, and Clonderlaw Bay. (10th Nov., 1874.)	Regulating the use of Drift Nets as follows:— First.—That no Drift Nets of greater length than 100 yards shall be used for the capture of Salmon or Trout in any part of the River Shannon between Limerick and a line drawn across the River below Askeaton, from Aughnish Point, in the County of Limerick, to Kildysart, in the County of Clare. Second.—That no Drift Nets of greater length than 200 yards shall be used for the capture of Salmon or Trout in any other Tidal Waters of the River Shannon, or in Clonderlaw Bay. Third.—That no two or more Drift Nets shall be attached together in any way or be allowed to drift within 150 yards of each other in the River Shannon, or in Clonderlaw Bay. Fourth.—That no Drift Nets below or seaward of a line drawn across the River Shannon, from Aughnish Point, in the County of Limerick, to Kildysart, in the County of Clare, shall be used within the line of low water mark of ordinary Spring Tides. Fifth.—That no Drift Nets shall be used in Clonderlaw Bay above a line drawn from Knock to Lacknabahee, in the County of Clare. Sixth.—That no Drift Nets shall be used in the Rivers Maigue or Askeaton.
River Deel, (6th June, 1877).	Prohibiting the use of all Nets (except Landing Nets as auxiliary to angling with rod and line) for the capture of Salmon or Trout, in that part of River situate between Broken Bridge and the mouth of River as defined.
Lough Derg, (19th June, 1877.)	Permitting the use of Nets not exceeding 12 yards in length, with Meshes of one inch from knot to knot for the capture of fish other than Salmon or Trout.
Ditto, (19th June, 1877.)	Prohibiting the use of Nets (except Landing Nets as auxiliary to angling with rod and line) for the capture of Fish other than Eels, between 8 o'clock in the evening and 6 o'clock in the morning.

APPENDIX, No. 14.

Abstract of By-Laws, Order, &c.

APPENDIX, No. 14—*continued.*

ABSTRACT of BY-LAWS, ORDERS, &c., in force on 1st January, 1879, relating to the SALMON FISHERIES of IRELAND.

Place affected by By-Law, and Date thereof.	Nature of By-Law.
	Limerick District—*continued.*
River Shannon, (23rd June, 1877.)	Repealing the first clause of By-law dated 22nd November, 1862, and in lieu thereof prohibiting between the 1st day of August, or such other day as at time may be the first day of the Close Season in which no Fish of the Salmon or Trout kind shall be killed, destroyed, or taken by any person or by any means whatsoever (save by single rod and line only), and the 1st day of November in each year, the use of Draft Nets or any other Net or Nets used as a Draft Net, having a foot rope and leads or weights affixed thereto, in that part of the River Shannon situate between the Fishing Weir known as the Lax Weir and a line drawn due North and South across the said River Shannon at the Western extremity of Graigue Island.
Lough Ree, River Shannon. (27th August, 1858.)	Permitting the use of Nets in Lough Ree, having a mesh of five inches in the round, measured when the Net is wet.
River Fergus, (26th June, 1865.)	Prohibiting the Fishing for Salmon or Trout by any means whatsoever, within a space of Twenty Yards from the Weir Wall of Ennis, on the River Fergus.
River Fergus, (16th Dec., 1870.)	Prohibiting the use of Drift Nets in the Tidal parts of River Fergus, County Clare.
River Maigue, (17th Oct., 1864.)	Prohibiting the use of Draft Nets between Ferry Drawbridge and the old Bridge of Adare.
Maigue River, (1st March, 1871.)	Prohibiting use of all Nets, except Landing-Nets as auxiliary to rod and line, above Railway-bridge below Adare.
	Galway District.
Galway River, Lough Corrib, &c. (24th July, 1846.)	Prohibiting the use of the Instrument, commonly called Strokehaul or Snatch, or any other such instrument, in River Galway, Loughs Corrib or Mask, or their Tributaries.
Whole District, (11th Sept., 1866.)	Prohibiting the snatching or attempt to *snatch* Salmon in any Tidal or Fresh Water in the Galway District with any kind of Fish-hook, covered in part or in whole with any matter or thing, or uncovered.
Clare and Clare-Galway or Turloughmore Rivers, Co. Galway. (22nd Dec., 1862.)	Prohibiting the use of Nets of any kind whatsoever in any part of the Rivers known as the Clare and the Clare-Galway or Turloughmore Rivers, in the County of Galway, above the junction of the said Rivers with Lough Corrib, in the County of Galway.
	Bangor District.
Owenmore River, Co. Mayo. (5th May, 1866.)	Prohibiting the removal of gravel or sand from any part of the bed of the Owenmore River, in the County of Mayo, where the spawning of Salmon or Trout may take place.
Owenduff or Ballycroy, Owenmore and Munhim Rivers. (11th Sept., 1866.)	Permitting the use of Nets with Meshes of one and a-half inches from knot to knot (to be measured along the side of the square, or six inches to be measured all round each such Mesh, such measurements being taken in the clear, when the Net is wet,) within so much of the said Rivers Owenduff or Ballycroy, Owenmore and Munhim, as lies above the mouth as defined, during so much of the Months of June, July, and August, as do now or at any time may form part of the Open Season for the capture of Salmon or Trout, with Nets, in the said Rivers.
	Ballina District.
Whole District, (21st May, 1870.)	Permitting use of Nets with Meshes of one and a quarter inches from knot to knot (to be measured along the side of the square, or five inches to be measured all round each such Mesh, such measurements being taken in the clear, when the Net is wet).
Moy River and Tributaries. (11th Feb., 1871.)	Prohibiting angling for Trout during April and May in each year—Loughs Conn and Cullen excepted.
	Sligo District.
Sligo River, (1st March, 1870.)	Prohibiting the snatching or attempting to snatch, Salmon in Sligo River, with any kind of Fish-hook covered in part or in whole, or uncovered.
Lough Doon, (24th March, 1871.)	Permitting use of Nets with meshes of half an inch from knot to knot, for capture of Fish.
Erne River, (13th Feb., 1871.)	Permitting use of Nets with meshes of one inch from knot to knot in tideway of River Erne.
Ditto, (1st June, 1872.)	Prohibiting the capture of Fish of any description with the instrument commonly called and known by the name of the Spoonbait, or any other instrument of the like nature or device during the months of January, February, and March in each year, in that part of the River Erne situated between the Falls of Belleek and a line drawn due south across the River, from the point of Castlecaldwell demesne, by the Eastern point of the Muckinish, or White Island, to the opposite Bank, all in the County of Fermanagh.
Lower Lough Erne, (30th June, 1874.)	Permitting use of nets with meshes of one inch from knot to knot for capture of fish by persons having right to use nets in said lough, between Enniskillen and Belleek, between 1st May and first day of close season in each year.
Eany Water, or Inver River. (25th June, 1872.)	Permitting use of Nets for the capture of Fish with Meshes of one inch from knot to knot (to be measured along the side of the square, or four inches to be measured all round each such Mesh, such measurements being taken in the clear when the Net is wet), within so much of the River Eany Water, or Inver, in the County of Donegal, as lies above the mouth of said river as defined.
	Letterkenny District.
Crana or Buncrana River. (5th Nov., 1877.)	Permitting the use of nets for the capture of Salmon or Trout with Meshes of one inch from knot to knot in the Crana or Buncrana River, and within one mile seawards and coastwards thereof.
	Londonderry District.
River Foyle, (28th Feb., 1871.)	Permitting the use of Nets with meshes of one inch from knot to knot in Lough Foyle and tidal parts of River.
Baronscourt Lakes and Streams. (22nd April, 1871.)	Permitting the use of Nets for the capture of fish, other than Salmon and Trout, with meshes of half an inch from knot to knot.
Tidal Waters, (5th June, 1878.)	Prohibiting having nets for capture of Salmon or Trout in or on board any boat, cot, or curragh in the Tidal Waters of said district, which comprises the whole of the sea along the coast between Malin Head, in the County of Donegal, and the townland boundary between the townlands of Drumagully and Downhill, in the County of Londonderry, with the whole of the tideway along said coast and rivers, and the whole of the tidal portion of the several rivers and their tributaries flowing into said coast between said points, at any time between the hours of twelve of the clock at noon on Saturday and four of the clock on Monday morning.
	Coleraine District.
Lough Neagh, (28th Feb., 1867.)	Prohibiting the use of Draft Nets for the capture of Pollen.
Lough Neagh, (20th Feb., 1871.)	Permitting Pollen to be taken by Trammel or Set Nets composed of Thread or Yarn of a fine texture, not less than ten hanks to the pound weight, doubled and twisted with a mesh of not less than one inch from knot to knot, from the 1st of February to the 31st October.
Whole District, (17th Oct., 1870.)	Prohibiting snatching or attempting to snatch Salmon in any of the tidal or fresh waters of District.
	Ballycastle District.
Bush River, (28th Feb., 1870.)	Repealing Definition of Bush River Estuary as fixed by the late Special Commissioners on 8th February, 1864.
	Dundalk District.
Between Clogher Head and Bellaghan Point. (29th April, 1872.)	Prohibiting to catch or attempting to catch Salmon or Trout with any Net of greater length than 500 Yards on that part of the Sea Coast situated between Clogher Head and Bellaghan Point, in the County of Louth.
Tidal Waters, (30th June, 1873.)	Prohibiting the catching or attempting to catch Salmon in any Tidal water of District between Dunany Point and Soldier's Point, in the County Louth, with a Spear, Lyster, Otter, Strokehaul, Dree-draw, or Gaff, except when the latter may be used solely as auxiliary to angling with Rod and Line, or for removing fish from any legal Weir or Box by the Owner or Occupier thereof.

Appendix No. 15.

Rivers, the Mouths of which have been defined in 1878, and to 31st March, 1879, making, with those enumerated in previous Reports, 148 in number.

District.	Name of River.	District.	Name of River.
Limerick,	Annagh.	Coleraine,	Main.
Do.,	Annageeragh.	Do.,	Blackwater.
Kenmare,	Tahilla.	Do.,	Sixmilewater.
Coleraine,	Moyola.	Do.,	Bann (Upper).
Do.,	Ballinderry.		

Appendix, No. 16.

Rivers, the Tidal and Fresh Water Boundaries of which have been defined to 31st March, 1879.

River.	Boundary.	Date
Adrigole,	Adrigole Bridge,	10th June, 1871.
Annagh,	Bealaclugga Bridge, between the townlands of Dough and Annagh,	27th November, 1878.
Annageeragh,	The barrier of stones at seaward side of Lough Donnell, between the townlands of Cloghauninchy and Cloonnagarnaun.	27th November, 1878.
Bandon,	The Bridge at Innoshannon, known as the Innoshannon Bridge,	19th January, 1865.
Bann,	The Down Stream end of Fishing Weir, known as the Cutts,	12th November, 1875.
Barrow,	The lowest Weir or Dam used for navigation purposes, near St. Mullins, in county Carlow,	16th March, 1864.
Blackwater,	A straight line drawn due north across river at townland boundary between townlands of Ballynelligan Glebe and Ballyeawest.	15th March, 1879.
Boyne,	Eastern Point of Grove Island at Oldbridge,	8th April, 1868.
Bride,	Tallow Bridge Quay,	26th January, 1874.
Carragh,	The Carragh Bridge, being the bridge immediately seaward of the Salmon Weir,	19th January, 1865.
Carrigboy,	Carrigboy Bridge,	10th June, 1871.
Dee,	Willistown Weir,	28th May, 1872.
Deel or Askeaton,	Askeaton Bridge,	26th November, 1870.
Eske,	Foot Bridge above Donegal Bridge,	17th July, 1868.
Fane,	The Railway Bridge across said River,	16th May, 1871.
Feale,	The Road leading through Killacrim from the Road leading from Listowel to Ennismore by a line drawn in continuation of said Killacrim Road across River.	4th October, 1875.
Fergus,	The Bridge commonly known as the New Bridge, immediately below the Club House, at Ennis,	9th April, 1864.
Finisk,	A straight line drawn in a westerly direction across river at townland boundary between townlands of Quarter and Bewley.	15th March, 1879.
Galey or Geale,	The Stream called and known by the name of the Gerah-Gloss, between the townlands of Gortacrossane and Beennameelane.	4th October, 1875.
Glengariffe,	Cromwell's Bridge,	10th June, 1871.
Glenshelane,	The bridge across river known as the Little Bridge near Cappoquin,	15th March, 1879.
Glyde,	Lynn's Weir,	28th May, 1872.
Goish,	A straight line drawn in a north easterly direction across river from a point on townland of Dromore, at the road leading to Villierstown, to a point on the townland of Coolahest.	15th March, 1879.
Greagagh,	A straight line drawn in a north westerly direction across river at the townland boundary between the townlands of Raheen and Ballyheeny.	15th March, 1879.
Inch,	Adare Bridge,	1st February, 1866.
Laune,	The shallow at the head of the Pool, commonly called the Cat Pool,	26th July, 1865.
Lee,	The Weir or Dam at the Water Works of Cork, known as the Water Works Weir,	12th August, 1864.
Licky,	The bridge across river known as the Ballyheeny Bridge,	15th March, 1879.
Liffey,	The Weir or Dam on said river known as the Island Bridge Weir,	12th August, 1864.
Maigue,	The Bridge across river immediately outside and seaward of the Adare Demesne,	12th August, 1864.
Maine,	A straight line drawn across river at right angles with its course at the boundary between the townlands of Coolclieve and Ballyfinnane.	26th July, 1865.
Mealagh or Dunnamark.	Wooden Bridge at Dunnamark Mill,	10th June, 1871.
Moy,	The foot of the falls immediately below the Weirs at Ballina,	26th July, 1865.
Nore,	The Innistiogue Bridge,	16th March, 1864.
Owvane or Ballylickey.	The Ballylickey Bridge on the High Road,	10th June 1871.
Shannon,	The Weir or Dam known as the Corbally Mill Weir,	9th April, 1864.
		25th August, 1869.
Shimna,	The Castle Bridge near Newcastle,	1st February, 1866.
Slaney,	Enniscorthy Bridge,	11th February, 1871.
Sligo or Garvogue,	The Mill Dam above Victoria Bridge, in town of Sligo,	10th June, 1871.
Snave or Coomhola,	Snave Bridge,	16th March, 1864.
Suir,	A line drawn across river at and opposite to the most up-stream part of the Coolnamuck Weir,	5th February, 1879.
Tahilla,	The mouth of river as defined 21st November, 1878, by a straight line drawn in a north easterly direction across said river from a point on townland of Tahilla to a point on townland of Derreennamucklagh.	15th March, 1879.
Tourig,	The bridge known as the Two Mile Bridge,	

APPENDIX, No. 17.

APPENDIX,

TABLE showing the CLOSE SEASONS for SALMON and TROUT in

No. and Name of District.	Boundary of District.	Tidal.
1. Dublin,	Skerries to Wicklow.	From Howth to Dalkey Island, between 15th August and 1st February. For remainder of District, between 15th September and 2nd March.
2. Wexford,	Wicklow to Kiln Bay, East of Bannow Bay.	Between 15th September and 20th April.
3. Waterford,	Kiln Bay to Helvick Head.	„ 15th August and 1st February.
4. Lismore,	Helvick Head to Ballycotton.	„ 31st August and 16th February.
5. Cork,	Ballycotton Head to Galley Head.	„ 15th August and the 15th of Feb., save in Bandon and Argideen Rivers; between 15th August and 1st March for Bandon, and between 31st August and 1st March for Argideen.
6[1]. Skibbereen,	Galley Head to Mizen Head.	„ 15th September and 1st May.
6[2]. Bantry.	Mizen Head to Crow Head.	„ 30th September and 1st May.
6[3]. Kenmare,	Crow Head to Lamb Head.	„ 15th September and 1st April.
7. Killarney,	Lamb Head to Dunmore Head, including Blaskets.	31st July and 16th January, save Rivers Maine, Ferta, or Valencia, Inny, and Waterville, and their Tributaries. Maine, Ferta or Valencia, Inny, and Tributaries, between 15th September and 1st May. Waterville and its Tributaries, between 16th July and 1st January.
8. Limerick,	Dunmore to Hags Head.	Between 31st July and 12th February, save River Cashen and Tributaries, and save between Kerry Head and Dunmore Head, and between Loop Head and Hags Head, and all Rivers running into the sea between those points. For River Cashen down to its Mouth and Tributaries, between 31st August and 1st June. Between Dunmore Head and Kerry Head, and all Rivers flowing into sea between those points, between 15th September and 1st April. Between Loop Head and Hags Head, and all Rivers running into the sea between those points, between 15th September and 1st May.
9. Galway,	Hags Head to Slyne Head.	Between 15th August and 1st February.
10[1]. Ballinakill,	Slyne Head to Pigeon Point.	Between the 31st of August and 16th of February, save in Louisburgh and Carrownisky Rivers and Estuaries. For Louisburgh and Carrownisky Rivers and Estuaries, between 15th of September and 1st July.
10[2]. Bangor,	Pigeon Point to Benwee Head.	Between 31st August and 16th February, save in Newport and Glenamoy, Burrishoole and Owengarve Rivers and Estuaries. For Newport River and Estuary, 31st August and 20th March; Glenamoy River and Estuary, 15th September and 1st May; Burrishoole and Owengarve River and Estuaries, 31st August and 16th February.
11. Ballina,	Benwee to Coonamore.	Between 12th August and 16th March, save Palmerston and Easkey Rivers, which is between 31st August and 1st June.
12. Sligo,	Coonamore to Mullaghmore.	„ 19th August and 4th February, save Sligo River, its Estuary and Tributaries, which is between 31st July and 16th January.
13. Ballyshannon,	Mullaghmore to Rossan.	„ 19th August and 1st March, save River Eske and Tributaries, which is between 17th September and 1st April.
14. Letterkenny,	Rossan to Malin Head.	„ 19th August and 4th Feb., and one mile above Tideway, save Crana or Buncrana, and Gweebarra Rivers. For Crana or Buncrana River, between 14th September and 15th April; for Gweebarra, between 30th Sept. and 1st April.
15[1]. Londonderry,	Malin to Downhill Boundary.	Between 31st August and 15th April.
15[2]. Coleraine,	Downhill Boundary to Portrush.	„ 19th August and 4th February.
16. Ballycastle,	Portrush to Donaghadee.	„ Do. do
17[1]. Drogheda,	Skerries to Clogher Head.	„ 4th August and 12th February.
17[2]. Dundalk,	Clogher Head to Donaghadee.	„ 31st August and 1st April, save in Annagassan, Glyde, Dee, and Fane Rivers. In Glyde, Dee, and Annagassan Rivers, between 19th August and 12th February; in Fane River between 19th August and 1st April.

NOTE.—The 21st section of the 26th & 27th Vic., c. 114, requires there shall not be fewer than 168 days Close Season in each Fishery.
WEEKLY CLOSE SEASON.—By the 20th section of the 26th & 27th Vic., c. 114, no Salmon or Trout shall be fished for or taken in any way, except by Single Rod and Line, between six of the clock on Saturday morning and six of the clock on the succeeding Monday morning.

No. 17.

the different Districts in Ireland on 31st December, 1878.

No.	Fresh Water.	Angling with Cross Lines.	Angling with Single Rod and Line.	Date of last change.	Principal Rivers in District. No.
1	Same as Tidal.	Same as Netting.	Between 31st Oct. & 1st day of Feb.	15th Oct. 1874.	1. Liffey, Bray, Vartry.
2	Same as Tidal.	Same as Netting.	Between 30th Sept. and 15th March.	26th Dec. 1873.	2. Slaney, Courtown, Inch, Urrin, Boro.
3	Same as Tidal.	Same as Netting.	Between 30th Sept. and 1st Feb.	12th Nov. 1874.	3. Suir, Nore, and Barrow.
4	Same as Tidal.	Same as Netting.	Between 12th Oct. and 15th Feb.	16th Dec. 1875.	4. Blackwater.
5	Same as Tidal.	Same as Netting.	Between 12th Oct. and 15th of Feb.	20th Dec. 1875.	5. Lee, Bandon, Argideen.
6[1]	Between 31st July and 1st May.	Same as Netting.	Between 31st Oct. and 17th March.	30th June, 1878.	6[1]. Ilen.
6[2]	Same as Tidal.	Same as Netting.	Do. do.	29th Jan, 1873.	6[2]. Glengariffe, Snave, &c.
6[3]	Same as Tidal.	Between 15th October and 1st April.	Between 31st Oct. and 1st day of Feb.	7th Feb. 1856.	6[3]. Blackwater, Roughty, Cloonee, Sneem.
7	Same as Tidal.	Same as Netting.	Between 30th Sept. and 1st Feb., save in Maine, Laune, Carra, and Tributaries. Maine and Tributaries, between 30th Sept. and 11th April. Laune, Carra, and Tributaries, between 30th Sept. and 16th Jan.	26th April, 1870. 18th Dec. 1875. 3rd Jan. 1876.	7. Inny, Rosbehy, Currane, Valencia, Maine, Laune, Carra.
8	Same as Tidal.*	Same as Netting.	Between 30th Sept. and 1st Feb., save Feale, Geale, Cashen, and Maigue Rivers and tributaries, and save in all rivers running into the sea, between Loop Head and Hags Head, and between Dunmore Head and Kerry Head. For Feale, Geale, and Cashen and tributaries, between 31st Oct. and 16th March; for Maigue and tributaries, between 30th Sept. and 20th Feb.; between Loop Head and Hags Head, between 30th Sept. and 1st March; and between Dunmore Head and Kerry Head, between 30th Sept. and 1st April.	13th Oct. 1874. 17th Sept. 1878.	8. Shannon, Deel, Fergus, Doonbeg, Cashen, Maigue, &c.
9	Same as Tidal.	Same as Netting.	Between 15th Oct. and 1st Feb., save in Cashla, Doohulla, Spiddal, Ballinahinch, Crumlin, Screeb, and Inver Rivers and their lakes and tributaries, which is between 31st Oct. and 1st Feb.	26th Dec. 1871. 23rd Oct. 1876. 17th Sept. 1877. 20th Aug. 1878.	9. Corrib, Cashla, Doohulla, Spiddle, Ballinahinch.
10[1]	Same as Tidal.	Same as Netting.	Between 31st Oct. and 1st Feb., save in Louisburgh and Carrownisky Rivers—between 31st Oct. and 1st July.	1st June, 1872.	10[1]. Erriff, Daurross, Louisburgh, Carrownisky.
10[2]	Same as Tidal.	Same as Netting.	Between 30th Sept. and 1st May, save in Owenmore and Munhim, which is between 30th Sept. and 1st Feb.; and save in Burrishoole, between 31st Oct. and 1st Feb.; and save Owengarve and Glenamoy, between 31st Oct. and 1st May; and save Owenduff or Ballycroy, and Ballyveeny and Owenduff, and all rivers in Achill Island, between 31st Oct. and 1st Feb.	1st June, 1872. 7th Oct. 1875. 5th Dec. 1876. Do.	10[2]. Newport, Owenmore, Burrishoole, Owengarve, Glenamoy, Ballycroy.
11	Between 31st July and 1st Feb., save Palmerston and Easkey Rivers, which is between 31st August and 1st June.	Same as Netting in fresh water.	Between 15th Sept. and 1st Feb., save Easkey River and Tributaries, which is between 30th Sept. and 1st June; and save Cloonaghmore or Palmerston River and Tributaries—tidal, between 31st Oct. and 1st Feb.; upper, between 31st Oct. and 1st June.	19th Dec., 1870. 10th July, 1877.	11. Moy, Easkey, Cloonaghmore.
12	Between 19th August and 4th February, save Sligo River, which is between 31st July and 16th January.	Same as Netting in fresh water.	30th Sept. and 1st Feb., save in Drumcliffe River and Glencar Lake between 19th Oct. and 1st Feb.	24th April, 1871. 27th Sept., 1877.	12. Sligo, Ballisodare, Drumcliffe.
13	Same as Tidal.	Same as Netting.	Between 9th Oct. and 1st March, save Bunduff, Bundrowes, and Erne Rivers, and Tributaries; Bunduff River, 30th Sept. and 1st Feb.; Bundrowes, 30th Sept. and 1st Jan., and Erne River, 30th Sept. and 1st March.	24th Nov. 1871. 26th June, 1875.	13. Glen, Inver, Eske, Bunduff, Bundrowes, Erne.
14	Between 19th Aug. and 1st Mar. Crana or Buncrana River, Leenane and Gweebarra Rivers, same as Tidal.	Same as Netting.	Between 1st Nov. and 1st Feb., save in Crana or Buncrana, between 31st Oct. and 1st March.	2nd Sept. 1857. 28th Feb. 1874. 25th Nov. 1874. 21st Mar. 1876.	14. Lennan, Gweedore, Gweebarra, Buncrana.
15[1]	Same as Tidal.	28th Sept. and 15th April.	Between 15th Oct. and 1st Mar.	27th Jan. 1862. 19th July, 1877.	15[1]. Foyle, Roe.
15[2]	19th August and 1st March.	28th Sept. & 16th March.†	Between 19th Oct. and 16th Mar., save Rivers Bann, Maine, Sixmilewater, Moyola and Ballinderry, between 31st Oct. and 1st Mar.	15th Dec. 1856. 31st Mar. 1871. 23rd Aug. 1875. 15th Jan. 1876.	15[2]. Bann.
16	Do.	28th Sept. and 16th March.	1st Nov. and 1st Feb.	15th Dec. 1856.	16. Ballycastle, Glenarm, Bush, Glendun.
17[1]	Same as Tidal.	Same as Netting.	4th August and 12th Feb.	20th Dec. 1876.	17. Boyne.
17[2]	Same as Tidal.	Same as Netting.	Between 11th Oct. and 1st March, save in Annagassan, Glyde, and Dee Rivers. In Annagassan, Glyde, and Dee Rivers, between 30th Sept. and 1st Feb.	8th July, 1872. 15th Jan. 1876.	17[2]. Fane, Annagassen, Glyde, Dee.

* Close Season for Fixed Engines for the capture of Eels, between the 10th January and 1st July, save in the River Shannon, which is between the 31st January and 1st July, and in all other rivers in the Limerick District between 31st December and 1st July in year following; and save in Drogheda District, which is between 30th November and 1st July, and save in the Coleraine District, which is between 10th January and 1st June, in year following.

† Pollen Fishing by Trammel Nets in Lough Neagh, between 31st October and 1st February.

APPENDIX, No. 18.

Certificates for Fixed Engines.

APPENDIX,

CERTIFICATES granted up to 31st December, 1878, for Fixed Engines for

No.	Place.	Name of Person to whom Certificate granted.	Date of Certificate.	District in which Net situated.	Description of Fixed Net.
65	River Moy,	Mary Anne Litle and Andrew Clarke,	2 May, 1870,	Ballina,	6 Fixed draft nets,
67	Ditto,	J. W. Stratford,	18 May, 1870,	Ditto,	3 Ditto,
85	Sea off coast, co. Mayo,	William Little,	8 June, 1870,	Ditto,	2 Bag nets,
109	Sea off coast, co. Sligo,	William Little,	16 May, 1872,	Ditto,	3 Ditto,
2	Sea off co. Antrim,	A. G. Fullerton,	5 September, 1865,	Ballycastle,	1 Ditto,
3	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
5	Ditto,	Thomas Black,	2 October, 1865,	Ditto,	1 Ditto,
6	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
7	Ditto,	Sir E. MacNaghten,	Ditto,	Ditto,	1 Ditto,
8	Ditto,	Thomas Black,	Ditto,	Ditto,	1 Ditto,
9	Ditto,	Earl of Antrim,	22 November, 1865,	Ditto,	1 Ditto,
10	Ditto,	Thomas Black,	2 October, 1865,	Ditto,	1 Ditto,
11	Ditto,	Ditto,	21 October, 1865,	Ditto,	1 Ditto,
14	Ditto,	J. C. Anderson,	28 October, 1865,	Ditto,	1 Ditto
15	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
50	Carnlough Bay,	Earl of Antrim,	8 February, 1870,	Ditto,	1 Ditto,
59	Off coast, co. Antrim,	Sir E. W. Macnaghten, bart.,	2 May, 1870,	Ditto,	1 Ditto,
60	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
61	Ditto,	Ditto,	Ditto,	Ditto,	1 Fixed draft net,
66	Ballycastle Bay,	Sir H. H. Boyd, bart.,	Ditto,	Ditto,	1 Ditto,
*70	Sea off coast, co. Antrim,	Denis Black,	11 May, 1870,	Ditto,	1 Ditto,
71	Ditto,	John Finlay,	Ditto,	Ditto,	1 Ditto,
72	Ditto,	John M'Gildowney,	Ditto,	Ditto,	1 Ditto,
73	Ditto,	Edmund M'Neill,	Ditto,	Ditto,	1 Ditto,
74	Red Bay,	H. H. M'Neill,	Ditto,	Ditto,	1 Ditto,
75	Sea off coast, co. Antrim,	Earl of Antrim,	Ditto,	Ditto,	1 Ditto,
82	Ditto,	Lady Boyd, on behalf of Sir H. H. Boyd, bart.	Ditto,	Ditto,	1 Ditto,
84	Ditto,	J. E. Leslie,	Ditto,	Ditto,	1 Ditto,
97	Ditto,	Earl of Antrim,	29 April, 1871,	Ditto,	1 Ditto,
100	Ditto,	Denis Black,	19 July, 1871,	Ditto,	1 Ditto,
116	Ditto,	John Finlay,	9 July, 1872,	Ditto,	1 Ditto,
117	Ditto,	Robert Woodside,	10 July, 1872,	Ditto,	1 Ditto,
23	River Erne,	Alicia Sheil,	20 January, 1866,	Ballyshannon,	1 Stake net,
64	Sea off Coast of Sligo,	Rt. Hon. W. Cowper Temple,	2 May, 1870,	Ditto,	1 Fixed draft net,
78	Sea off coast, co. Donegal,	H. G. Murray Stewart,	13 May, 1870,	Ditto,	2 Ditto,
79	Inver Bay,	William Sinclair,	Ditto,	Ditto,	2 Ditto,
80	Sea off coast, co. Donegal,	Marquis Conyngham,	Ditto,	Ditto,	1 Ditto,
83	Ditto,	Ebenezer Bustard,	Ditto,	Ditto,	1 Ditto,
90	River Erne,	R. L. Moore and others,	7 February, 1871,	Ditto,	3 Ditto,
62	Island of Achill,	Alexander Hector,	2 May, 1870,	Bangor,	1 Bag net,
68	Owenmore River,	William Petrie,	18 May, 1870,	Ditto,	1 Fixed draft net,
69	Owenmore and Ballycroy Rivers,	Helen Little,	19 May, 1870,	Ditto,	7 Ditto,
110	Sea off coast, co. Mayo,	Sir F. A. K. Gore, bart.,	25 May, 1872,	Ditto,	2 Bag nets,
111	Ditto,	William Pike,	1 July, 1872,	Ditto,	2 Ditto.
112	Ditto,	Trustees Achill Mission,	Ditto,	Ditto,	4 Ditto,
113	Ditto,	Ditto,	Ditto,	Ditto,	5 Ditto,
114	Ditto,	Ditto,	Ditto,	Ditto,	3 Ditto,
1	Sea off co. Londonderry,	Henry O'Neill,	31 August, 1865,	Coleraine,	1 Bag Net,
12	Sea off co. Antrim,	Thomas Black,	21 October, 1865,	Ditto,	1 Ditto,
93	Bann River,	The Irish Society,	15 February, 1871,	Ditto,	4 Fixed draft nets,
26	Ringabella Bay,	Samuel Hodder,	7 March, 1867,	Cork,	1 Bag Net,
86	Cork Harbour,	Sampson French,	22 September, 1870,	Ditto,	1 Stake net,
119	Ditto,	John Charles Bennett,	28 December, 1876,	Ditto,	1 Ditto,
13	Sea off co. Louth,	Sir Alan E. Bellingham,	28 October, 1865,	Dundalk,	1 Head Weir,
18	Ditto,	John F. Jones,	16 November, 1865,	Ditto,	1 Bag Net,
115	Ditto,	Arthur Newcomen	10 July, 1872,	Ditto,	1 Ditto,
4	Kenmare River,	E. B. Hartopp,	16 January, 1866,	Kenmare,	1 Ditto,
31	River Leenane (Estuary),	Sir J. Stewart, bart.,	13 May, 1870,	Letterkenny,	1 Fixed draft net,
118	Sea off coast, co. Donegal,	Charles F. Stewart,	19 June, 1873,	Ditto,	3 Bag nets,
121	Estuary of Craua or Castle River,	Alexander A. Richardson,	3 October, 1877,	Ditto,	1 Fixed draft net,
17	River Shannon,	William B. Barrington,	7 November, 1865,	Limerick,	1 Fly Net,
24	Ditto,	S. Cunningham,	16 March, 1866,	Ditto,	1 Stake Net,
25	River Bunratty,	Thomas Studdert,	11 February, 1867,	Ditto,	1 Head Weir,
31	Doonmore Strand,	John Scott,	19 May, 1868,	Ditto,	1 Salmon Weir or Wall.
32	Doonbeg Strand,	W. Stacpoole,	Ditto,	Ditto,	1 Ditto,
35	Shannon,	William Creagh Hickie,	8 February, 1870,	Ditto,	1 Stake net,
36	Ditto,	Colonel C. M. Vandeleur,	Ditto,	Ditto	1 Ditto,
37	Clonderalaw Bay,	Lord Annaly,	Ditto,	Ditto,	1 Ditto,
38	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
39	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
40	Ditto,	R. W. C. Reeves,	Ditto,	Ditto,	1 Ditto,
41	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
42	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
43	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
44	Shannon,	Knight of Glin,	Ditto,	Ditto,	1 Ditto,
45	Ditto,	C. H. Minchin,	Ditto,	Ditto,	1 Ditto,
48	Clonderalaw Bay,	Col. H. Hickman,	Ditto,	Ditto,	1 Ditto,
49	Shannon,	John Griffin,	Ditto,	Ditto,	1 Ditto,
52	Ditto,	Leslie Wren,	Ditto,	Ditto,	1 Ditto,
53	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,

* This certificate lapsed

No. 18.

fishing for Salmon or Trout (arranged in Districts).

No.	Particulars of Size, &c.	Observations.
65	6 nets, from 150 to 250 yards in length,	—
67	3 nets, not exceeding 80 yards in length,	Scurmore fixed nets.
85	Leaders, 50 fathoms long each; and each bag about 7 feet wide,	Kilcummin bag nets.
109	Leaders, each 50 fathoms long; heads, 6 fathoms each,	Enniscrone nets.
2	Leader, 72 yards; net, 20 yards,	Larrybane net.
3	Leader, 50 yards; net, 20 yards,	Carrickaraide net.
5	Leader, 600 feet; net, 66 feet,	Curran net.
6	Leader, 330 feet; net, 66 feet,	Big Duncan net.
7	Leader, 246 feet; net, 84 feet,	Portbradden net.
8	Leader, 330 feet; net, 66 feet,	Skerryvan net.
9	Leader, 150 feet; net, 48 feet,	Torr net.
10	Leader, 240 feet; net, 66 feet,	Little Duncan net.
11	Leader, 288 feet; net, 66 feet,	Portneen net.
14	Net, 316 feet; head, 63 feet,	Portfad net.
15	Ditto, ditto,	Portmoon net.
50	Leader, 115 yards long; head 43 feet long,	Carnlough net.
59	Leader, 95 yards long; head, 21 yards long,	Blackrock bag net.
60	Leader, 74 yards long; head, 21 yards long,	Glashan Island bag net.
61	Length, 100 yards,	Cregganeagh net.
66	Length, 100 yards,	Ballycastle net.
*70	Length, 300 feet,	Moneyvart fixed draft net.
71	Length, 80 yards,	Ballyteerim fixed net.
72	Length, 104 yards,	Clarepark fixed net.
73	Length, 90 yards,	Currysheskin fixed net.
74	Length, 116 yards,	Red Bay fixed draft net.
75	Length, 100 yards,	Layd fixed draft net.
82	Length, 90 yards,	Kinbane net.
84	Length, 75 yards,	Templastragh net.
97	120 yards long,	Pier net.
100	Length, 100 yards,	Moneyvart, otherwise Portvinegar, draft net.
116	43 fathoms long,	Sleans net.
117	Leader, 74 yards long; head, 26 yards long,	Cregganboy net.
23	Land arm, 210 yards flood,	Erne weir.
64	Length, 120 yards long,	Mullaghmore net.
78	2 nets, not exceeding 250 yards in length,	Muckross & Gortalia nets.
79	2 nets, 140 yards long,	Inver nets.
80	Length, 130 yards,	Ballyederlane net.
83	Length, 90 yards,	Drumbanan net.
90	Each 200 yards long,	—
62	Leader, 150 yards long; head, 18 yards long,	Keel net.
68	3 nets, not exceeding 120 yards in length,	Owenmore nets.
69	7 Ditto, 300 ditto,	Tullaghan nets.
110	Leaders, 40 fathoms long; heads, 5 fathoms long,	Cushlecka and Dooghbeg nets.
111	Leaders, 40 fathoms long, and heads 5 fathoms long,	Dooega nets.
112	Leaders, 40 fathoms; heads, 5 fathoms long,	Slievemore nets.
113	Leaders, 40 fathoms long; head, 5 fathoms long,	Doogort nets.
114	Ditto, ditto,	Keel nets.
1	Net, 138 yards—first pole from shore, 12 yards; last do., 150 yards,	Ballygelagh net.
12	Leader, 330 feet: net, 66 feet,	Flagstaff net.
93	Not exceeding 240 yards length,	—
26	Leader, 240 feet; length of net, 22 feet,	Ringabella net.
86	Length, 60 yards,	Cuskinny net.
119	Length, 158 feet—such measurement not to extend said fixed engine beyond the low water mark of ordinary spring tides.	Bennett's Court stake net.
13	South side, 627 feet; east side, 204½ feet; Fish Pass south side, 3½ feet; open at end in river, 4½ feet,	Castlebellingham weir.
18	Leader, 360 feet; bag, 42 feet; first pole, 300 feet from fixed point on shore,	Draghenstown net.
115	Leader, 50 fathoms long; head, 9 fathoms,	St. Dennis's Well net.
4	Leader, 240 feet; net, 54 feet,	Rath.
81	Length, 120 yards,	Leenane net.
118	Leaders not exceeding 80 yards each in length, and the heads 24 yards in length and 10 yards in width.	Horn Head nets.
121	Length not exceeding 95 yards,	Crana fixed net.
17	Weir, 190 feet; H.W.M. to in-pole, 90 feet,	Shannon Lawn weir.
24	Wing, 42 yards; ebb wing, 44 yards,	Ayleroebeg weir.
25	138 feet; 18 feet eye,	Bunratty weir.
31	660 feet,	Doonmore weir.
32	1,254 feet,	Doonbeg weir.
35	306 yards long,	Cloonaman weir.
36	The leader, 274 feet long; and head, 50 feet long and 19 feet wide,	Mount Shannon weir.
37	The first or shore leader 167 yards long; the head 20 yards long and 14½ yards wide. The second leader 136 yards long; and the second head 20 yards long and 14½ yards wide.	Millpark weir.
38	The first or shore leader, 154 yards long; first head, 20 yards long and 14½ yards wide. The second leader, 130 yards long; second head, 20 yards long and 14½ yards wide.	Lacknabahee weir.
39	The leader 120 yards long, and the head 20 yards long by 14½ yards wide,	Lakyle weir.
40	The leader 60 yards long, and the head 26 yards long and 7 yards wide,	Lynch's Point weir.
41	The leader 115 yards long, and the head 28 yards long and 12 yards wide,	Park Ruagh weir.
42	The leader 78 yards long, and the head 28 yards long and 9 yards wide,	Poulnaguilky weir.
43	The leader 80 yards long, and the head 28 yards long and 11 yards wid	Woodpoint weir.
44	The first leader 492 feet long; first head 45½ feet. Second leader, 224 feet long; second head, 73½ feet. Third leader, 242 feet long; third head, 72 feet; and the fourth leader, 272½ feet long; fourth head, 73 feet.	Long Rock weir.
45	Leader, 49½ yards long; and head, 32 yards long,	Killacolla weir.
48	The first leader, 169 yards long; first head, 14 yards long. Second leader, 111 yards long; second head, 3½ yards long.	Kilmore Point weir.
49	The first leader, 332 feet long; first head, 39 feet long and 15 feet wide. Second leader, 233 feet long; second head, 73 feet long and 16½ feet wide. Third leader, 183 feet long; head, 97 feet long and 17 feet wide.	Carrowbanebeg weir.
52	Entire length, 324 yards,	Carrigane weir.
53	Entire length, 167 yards,	Kylatallin weir.

into certificate 100.

APPENDIX, No. 18.

Certificates for Fixed Engines.

APPENDIX,

CERTIFICATES granted up to 31st December, 1878, for Fixed

No.	Place.	Name of Person to whom Certificate granted.	Date of Certificate.	District in which Net situated.	Description of Fixed Net.
54	Shannon,	Baron Monteagle,	11 February, 1870,	Limerick,	1 Stake Net,
55	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
56	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
57	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
58	Ditto,	Thomas Sandes,	12 March, 1870,	Ditto,	1 Ditto,
87	Ditto,	Robert Leslie,	16 January, 1871,	Ditto,	1 Ditto,
88	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
89	Ditto,	Thomas Sandes,	Ditto,	Ditto,	1 Ditto,
101	Ditto,	Lord Annally,	10 November, 1871,	Ditto,	1 Ditto,
102	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
103	Ditto,	R. W. C. Reeves,	11 November, 1871,	Ditto,	1 Ditto,
104	Ditto,	Colonel Vandeleur,	10 November, 1871,	Ditto,	1 Ditto,
105	Ditto,	Ditto,	11 November, 1871,	Ditto,	2 Ditto,
106	Ditto,	Ditto,	10 November, 1871,	Ditto,	1 Ditto,
107	Ditto,	Benjamin Cox,	11 November, 1871,	Ditto,	1 Ditto,
120	Ditto,	Randal Borough,	12 May, 1877,	Ditto,	1 Ditto,
122	Ditto,	Robert Leslie,	24 April, 1878,	Ditto,	2 Ditto,
124	Shannon, off Scattery Island,	Marcus Keane,	31 January, 1879,	Ditto,	3 Ditto,
123	Shannon,	William Creagh Hickie,	Ditto,	Ditto,	1 Ditto,
125	Shannon, off Carrig Island,	Charles Sandes,	7 March, 1879,	Ditto,	1 Ditto,
16	Ballycotton Bay,	John Litton,	31 October, 1865,	Lismore,	1 Bag Net,
28	River Blackwater,	John Neil and William Hennessy,	14 January, 1868,	Ditto,	1 Stake Net,
98	Ditto,	Trustees, Provincial Bank,	15 February, 1872,	Ditto,	1 Stake Weir,
99	Ditto,	Hon. C. W. Moore Smyth,	21 June, 1871,	Ditto,	1 Ditto,
20	Lough Foyle,	The Irish Society,	2 January, 1866,	Londonderry,	1 Stake Net,
21	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
22	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
30	Sea off co. Donegal,	George Young,	27 April, 1868,	Ditto,	1 Bag Net,
33	Ditto,	Ditto,	6 October, 1868,	Ditto,	1 Ditto,
34	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
63	Magilligan Strand,	Sir H. H. Bruce, bart.,	2 May, 1870,	Ditto,	1 Ditto,
76	Sea off coast, co. Londonderry,	Alexander Shuldham, A. W. White, and R. J. Broughton.	11 May, 1870,	Ditto,	4 Fixed draft nets,
77	Ditto,	John Cromie,	Ditto,	Ditto,	3 Ditto,
92	Magilligan Strand,	Sir H. Bruce, bart.,	22 April, 1871,	Ditto,	1 Ditto,
94	Ditto,	James M'Gowery,	15 February, 1871,	Ditto,	1 Ditto,
95	Ditto,	William Lorton,	Ditto,	Ditto,	1 Ditto,
96	River Foyle,	The Irish Society,	Ditto,	Ditto,	8 Ditto,
27	Sea off co. Sligo,	Ormsby Jones,	4 November, 1867,	Sligo,	1 Bag Net,
29	Ditto,	Lady Palmerston and Right Hon. W. Cowper-Temple.	20 January, 1868,	Ditto,	1 Ditto,
91	Sligo River,	Abraham Martin,	20 February, 1871,	Ditto,	2 Fixed draft nets,
108	Drumcliffe River,	William Petrie,	12 April, 1872,	Ditto,	1 Ditto,
19	Barrow, otherwise Suir, Nore, and Barrow conjoined.	Lord Templemore,	4 December, 1865,	Waterford,	1 Head Weir,
46	Waterford Harbour,	A. N. O'Neill,	3 February, 1870,	Ditto,	1 Stake Net,
47	Ditto,	Ditto,	Ditto,	Ditto,	1 Ditto,
51	King's Channel,	Ditto,	Ditto,	Ditto,	2 Ditto,

APPENDIX, No. 19.

APPENDIX,

RESULT of INQUIRIES held by the INSPECTORS of IRISH FISHERIES into the Legality or Illegality of

No.	Where Fixed Net situated.	Description of Fixed Net.	Name of Person maintaining and using Fixed Net.	Name of Owner of Fixed Net, or of Land to which Net attached.	Name of Townland to which Net attached.	Parish.
400	River Shannon,	1 Stake net,	Margaret Borough,	Margaret Borough,	Querrin,	Moyarta,
401	Do.,	2 Do.	Robert Leslie,	Robert Leslie,	Kilpaddoge,	Kilnaughton,
402	River Shannon, off Scattery Island,	4 Do.	Marcus Keane,	Marcus Keane,	Scattery Island,	Kilrush,
403	River Shannon,	1 Do.,	William C. Hickie,	William C. Hickie,	Cloonaman,	Aghavallen,
404	Do.,	1 Do.,	Charles Sandes,	Charles Sandes,	Carrigh Island,	Do.,
405	Do.,	1 Do.,	Do.,	Do.,	Do.,	Do.,

APPENDIX No. 20.

APPENDIX, No. 20.

QUANTITY of SALMON exported to undermentioned places in England, from Ireland, from 1st January to 31st December, 1878.

	No. of Boxes of 150 lbs. each.	
London,	4,378	computed at 1*s.* 3*d.* per lb. Value delivered at foregoing places would be £418,476 11*s.* 3*d.*
Nottingham,	2,793	
Bradford,	3,679	
Manchester,	6,555	
Sheffield,	4,641	
Wolverhampton,	3,110	
Leeds,	4,000½	
Liverpool,	8,761	
Birmingham,	6,720	
Total, 1878,	44,637½	
Total, 1877,	47,934	Decrease. 3,296½

No. 18—*continued.*

APPENDIX, No. 18.

Certificates for fixed Engines.

Engines for fishing for Salmon or Trout—*continued.*

No.	Particulars of Size, &c.	Observations.
54	Leader, 200 feet long; head, 84 feet long,	Foyne's Island (south) weir.
55	Leader, 187 feet long; head, 80 feet long, and 18 feet 6 inches wide,	Foyne's Island (north) weir.
56	The first leader, 398 feet long; first head 103 feet long and 14 feet wide. Second leader, 235 feet long; second head, 96 feet long and 19 feet wide.	Durnish weir.
57	The first leader, 300 feet long; first head, 40 feet long and 33 feet wide. Second leader, 210 feet long; second head, 93 feet long, 18 feet wide.	Mount Trenchard weir.
58	Size—327 feet from high-water mark,	Coolnanoonagh weir.
87	Length, 117 yards,	Tarbert net.
88	Length, 67 yards,	Kilpadogue net.
89	Length, 32 yards 2 feet,	Ralapane net.
101	Leader, 110 yards long,	River weir.
102	Leader, 70 yards long,	Battery weir.
103	Leader, 103 yards long; head, 26 yards, and 8 wide,	Poulnadarree weir.
104	Leader, 69 yards long; head, 7 yards long,	Ayelvarroo or Ballynote west weir.
105	E. Weir, leader, 78 yards long; head, 17 yards—W. Weir leader, 95 yards long; 3 heads each, 17 yards long.	Carrowdotia eastern & western weirs.
106	Leader, 90 yards long; head, 17 yards long,	Colmanstown weir.
107	5 leaders, each 120 yards, and 5 heads, each 17 yards long,	Clarefield weir.
120	4 heads, whole length not to exceed 550 yards, measurements not to extend fixed engine below low water of ordinary spring tides.	Shangannagh weir.
122	No. 1, 112 yards in length, and No. 2, 90 yards in length, measurements not to extend fixed engines below low water of ordinary spring tides.	—
124	C net, 300 yards long; D net, 138 yards long; and E net, 525 yards long,	Scattery Island weirs.
123	Three heads; the whole length not exceeding 350 yards,	Cloonaman weir.
125	300 yards long,	Carrig Island weir.
16	271 feet,	Ballycotton net.
28	185 feet, Leader,	Scart weir.
98	Length of Shore-arm, 70 feet; body of Weir, 83 feet; Flood-arm, 15 feet; large yard, width, 18 feet; Fish pocket, width, 17 feet.	Stael weir.
99	Leader, 94 feet long; head, 108 feet—Ballinatray Weir,	Ballynatray weir.
20	In-pole of Shore Leader to outer pole of same, 153 feet; out-pole of do. to do. of Ebb Leader, 82 feet; out-pole of chambers of net channelwards, 17 feet.	The Crook weir.
21	In-pole of Shore Leader to outer pole of same, 196 feet; out-pole of do. to do. of Flood Leader, 112 feet; out-pole of chambers of net channelwards, 22 feet.	The Shell Rock weir.
22	In-pole of Shore Leader to outer pole of same, 262 feet; out-pole of do. to do. of Flood Leader, 152 feet,	The Chapel Brook weir.
30	348 feet, inner to outer pole,	Claggan net.
33	Leader, 270 feet; bag, 78 feet,	Bunnagee net.
34	Ditto, ditto,	Carrickafual net.
63	Leader, 315 yards long; head, 17 yards long,	Ballymaclary net.
76	2—320 yards in length; and 2—140 yards in length,	Crossreagh and Tullaghnurney nets.
77	2 nets, 150 yards long; and 1—122 yards long,	Mullaghacall nets.
92	Not exceeding 240 yards length,	—
94	160 yards long,	—
95	150 yards long.	—
96	From 100 to 200 yards long,	—
27	Leader, 110 yards; length of net, 20 yards,	Streedagh net.
29	366 feet, inner to outer pole,	Mullaghmore net.
91	Each not exceeding 135 yards length,	—
108	150 yards in length,	Drumcliffe net.
19	Shore wing, 225 feet; channel wing, 94 feet; space between shore wing and rock, 45 feet,	Buttermilk Castle weir.
46	The first leader, 383 yards long; and the second leader, 436 yards 1 foot long,	Knockavelish weir.
47	The first leader, 552 yards long; second leader, 398 yards 1 foot long,	Woodstown weir.
51	Lower weir—leader, 88 yards long; upper weir—leader, 33 yards long. The head or pocket of the former extending from west to east 34 yards in breadth, and the latter extending from west to east 52 yards.	King's Channel weirs (2).

No. 19.

APPENDIX, No. 19.

Fixed Nets erected or used for catching Salmon in Ireland, during the year 1878, and to 31st March, 1879.

No.	Barony.	County.	Judgment of Commissioners.	Date of Judgment.	Whether Judgment of Commissioners appealed against.	Result of Appeal in Court of Queen's Bench.
400	Moyarta,	Clare,	Refused,	23rd March, 1878.	Appeal.	—
401	Iraghticonnor,	Kerry,	Legal,	Do.	—	—
402	Moyarta,	Clare,	Report made to Court,	—	—	Judgment reversed
403	Iraghticonnor,	Kerry,	Legal,	8th January, 1879.	—	—
404	Do.	Do.,	Adjourned,	—	—	—
405	Do.	Do.,	Legal,	29th January, 1879.	—	—

APPENDIX, No. 21.

APPENDIX, No. 21.

QUANTITY of SALMON consigned to Billingsgate Market, from Ireland, during the year 1878.

4,378 large boxes, average weight 150 lbs. each, at 1*s.* 3*d.* per lb., equal to £41,043 15*s.* 0*d.*

DUBLIN: Printed by ALEXANDER THOM, 87 & 88, Abbey-street,
Printer to the Queen's Most Excellent Majesty.
For Her Majesty's Stationery Office.

RETURN to an Order of the Honourable the House of Commons, dated 24 July 1879 ;—*for*,

COPY "of the REPORT of the INSPECTORS of IRISH FISHERIES, dated January 1877, on the Subject of BRANDING HERRINGS in *Ireland* and *Scotland*, and referred to in the Report of the Inspectors for 1878."

REPORT of the INSPECTORS of IRISH FISHERIES.

To the Right Honourable the Chief Secretary for Ireland.

Office of Irish Fisheries, 12, Ely-place, Dublin,
13 January 1877.

Sir,

REFERRING to your letter of the 3rd of April last, in which we are directed to inquire into, and report, for the information of his Grace the Lord Lieutenant, our opinion " upon the advisability of extending to Ireland the Scotch system of branding herrings, and also whether any practical benefit would really be derived from such extension, having regard to the circumstances of the Irish herring fishery trade ; we beg to report, in accordance with the instructions of his Grace, that one of our Board (Mr. Brady) proceeded to Scotland and investigated the details connected with the Scotch herring fisheries, and the branding system pursued in certain places there ; a copy of his Report is annexed, marked (A.).

Inquiries were also held at the principal herring fishing stations in Ireland, and we investigated the subject from time to time at other places as opportunity offered. After a very careful consideration of the question in every point, we have to report that we are unable to recommend that the branding system should be extended to this country, and in this we are mainly influenced by the following reasons :—

1st. Although it has from time to time been argued that the introduction of the brand would lead to a further development of the herring fisheries in Ireland, we have been unable to find that any *bonâ fide* desire for it exists amongst the Irish fishermen or curers.

2nd. It appears that in Scotland, where the fish are cured for the foreign markets, the price received by the fishermen is about 22 *s.* per cran of 960 herrings ; whereas in Ireland, sold by auction immediately after being caught, they have realised much higher prices to the captors, as will be seen by the following average prices of the last four years.

The Irish herrings realised—

In 1873, 1 *l.*	0 *s.*	5 *d.*	per mease of 635,	equal to about	1 *l.*	10 *s.*	10 *d.*	per cran of 960.
1874, 0 *l.*	18 *s.*	9 *d.*	„	„	1 *l.*	8 *s.*	4 *d.*	„
1875, 1 *l.*	1 *s.*	9 *d.*	„	„	1 *l.*	12 *s.*	11 *d.*	„
1876, 1 *l.*	6 *s.*	0 *d.*	„	„	1 *l.*	19 *s.*	4 *d.*	„

These figures show that under present circumstances the Irish fishermen realise much higher prices than those obtained in Scotland.

3rd. Any herrings cured at present in Ireland, as a matter of fact, sell at higher prices than can be obtained for the highest brand of Scotch herrings ; therefore in our opinion the extension to Ireland of the Scotch branding system would not be advisable, and we consider that no material benefit would really

be derived from such extension, having regard to the circumstances of the Irish herring fishery trade.

We think it right to add, that should the important harbours of Ardglass and Arklow be rendered fully available to give proper shelter in uncertain weather to the herring fleet, we are of opinion a considerable development of the herring fishery may fairly be looked for.

Referring to a paragraph in Mr. Brady's Report, in which he suggests that it would be desirable to test the allegations as to "the herrings caught on the East Coast of Ireland in summer, being too rich to cure for the continental market, as they will not keep over for any time, and that parcels of Irish cured fish sent to the continental market did not pay the expenses; with regard to the winter-cured fish, that the quality is not good enough, much of it being spent and mixed fish;" we thought it might be of advantage to test this matter, and recommended that his suggestion should be carried out, but the necessary expenditure was not sanctioned by the Lords Commissioners of Her Majesty's Treasury.

We have, &c.

(signed) *Thomas F. Brady.*
John A. Blake.
Jos. Hayes.

(A.)

REPORT of Mr. *T. F. Brady*, Inspector of Irish Fisheries, dated 17 August 1876.

With reference to my recent visit to Scotland to obtain information respecting the applicability of the branding system to Ireland, I beg to report that I arrived in Edinburgh on the 14th June, and after an interview with the Secretary of the Board of Fisheries and the chief superintendent, from both of whom I received a vast amount of information and great attention, I proceeded, as suggested by them, to the fishing stations at Aberdeen, Peterhead, Fraserburgh, and Wick, and afterwards to Glasgow, where there are a number of merchants engaged in the curing of herrings every season in Ireland.

Until 1858 branding of herrings was carried on in Scotland free of expense to the curers. In that year an Act of Parliament was passed (21 & 22 Vict. c. 69), imposing a fee of 4 *d.* on each barrel. Instead of having the effect of leading to the branding being given up by the trade, as was generally at the time anticipated, the quantity cured and branded has increased from 158,676 barrels in 1859, producing from fees 2,644 *l.* 12 *s.*, to 523,789½ barrels in 1875, producing 8,729 *l.* 16 *s.* 6 *d.*; while the cost of the establishment for branding made by the Treasury Commission of Inquiry into the Fishery Board, Scotland, in the year 1856, was estimated to be only 3,280 *l.* If this be a correct estimate, it would leave, in 1875, a balance to the credit of the estimate of the other expenses of the Fishery Board of 5,449 *l.* 16 *s.* 6 *d.* paid into the Treasury.

The following is a return of the number of barrels branded from 1859 to 1875, inclusive, together with the amount of fees collected thereon:—

—	Barrels Branded.	Fees Collected.			—	Barrels Branded.	Fees Collected.		
		£.	s.	d.			£.	s.	d.
1859 - -	158,676	2,644	12	–	1868 - -	209,462½	3,491	–	10
1860 - -	231,913½	3,865	4	6	1869 - -	244,522½	4,075	7	6
1861 - -	265,347	4,422	9	–	1870 - -	299,381½	4,989	13	10
1862 - -	346,712	5,778	10	8	1871 - -	346,633½	5,777	4	6
1863 - -	276,880½	4,614	13	6	1872 - -	422,731½	7,045	10	6
1864 - -	217,392	3,623	4	–	1873 - -	435,274½	7,254	11	6
1865 - -	216,785	3,613	1	8	1874 - -	517,558½	8,625	19	6
1866 - -	249,510	4,158	10	–	187 - -	523,789½	8,729	16	6
1867 - -	317,421	5,290	7	–		5,279,991	87,999	17	–

There

There are five descriptions of brands, viz.,—

Crown, full ($\frac{\text{Full}}{\text{F.P.}}$).
Matties - (Mat.).
Spent - (Spt.).
Mixed, not selected (P.).
Twice packed - (P.P.).

On each brand the year of cure is indicated, together with the initials of the fishery officer who branded each barrel. The branding irons are kept in the custody of the different fishery officers, of whom there are 16 on the East Coast and 10 on the West Coast. Branding is not demanded on the West Coast, and when the great summer herring fishery sets in on the East Coast, many of the officers from the West Coast are transferred to the principal stations on the East Coast to assist the officers there, who would otherwise be unable to carry out in time the provisions of branding at these stations.

It is the duty of each fishery officer before the fishing season commences, and when the barrels are being made at the different curers' establishments, to inspect and examine the barrels to see that they are of the size required by the Act and regulations of the Commissioners, viz., $26\frac{2}{3}$ gallons, Imperial measure, and every half barrel $13\frac{1}{3}$ gallons. During the process of curing they are also constantly inspecting the operations being carried on, to see that the herrings are properly gutted and cured. At the end of each week they have to furnish returns to the Board of the number of boats fishing, the gross number of crans taken, the gross number of barrels cured, the gross number branded, the gross number delayed, the gross number rejected, and the gross number exported.

They have also to furnish returns weekly, showing the fishing *each day* during the week, the number of boats fishing each day, the quantity captured, the distance off shore where fish captured, and the general state of the weather, in minute detail; so that the information collected on this subject and furnished regularly to the Board is of the most perfect character, and forms an amount of statistics which must be of great importance from time to time. The quantity of fish captured is ascertained by measure, and not by number, as in Ireland.

In Ireland the herrings are sold by the *mease*, which counts five long hundreds of six score each, two casts and five over; so that a *mease* is equal to 635 herrings.

In Scotland they are *measured* by the *cran*; or more generally lately by the *basket*, which is supposed to hold one *quarter of a cran*. The cran is in each curer's yard, and is branded by the fishery officer in the particular manner set out in the regulations of the Commissioners, and in case of any dispute as to the baskets used holding more or less than they should, it is determined by the cran, four baskets going to the cran. A cran will hold, according to the size of the fish, seven to eight long hundreds, equal to about 960 herrings. The fish are not sold at the great fish-curing stations, as in Ireland, by auction, or at the day's price.

The practice in Scotland is for the curers to engage a certain number of boats' crews for the season, who are bound by written agreement to deliver their capture to the curers who engage them, up to 200 crans for each boat.

Should they capture more than this quantity they are at liberty to dispose of them in any way they please.

The average contracts are 20 *s.* per cran, together with bounty varying from 5 *l.* to 20 *l.*, and what is called "perquisites," *i.e.*, ground for drying their nets and cartage of nets to drying ground, free. This will come, on an average, to 5 *l.* for each boat, so that the cost of the herrings to the curer may be put down, on an average, at 22 *s.* the cran.

When the contracts are entered into, each curer knows, almost to a certainty, the quantity of fish he is likely to receive, and can make his arrangements accordingly in preparing a certain number of barrels, taking in a certain quantity of salt, and engaging beforehand a certain number of coopers, who are curers, and a certain number of women for gutting. The latter is one of the most important matters, as unless the fish are all properly gutted and salted *within* 24 *hours of capture* they would not be branded. The fishermen are also satisfied with this system, as they know exactly how much they are enabled to earn, and if they work more diligently than others, or have a better season than usual they can make so much more, after completing their contracts of 200 crans for each boat.

The whole is therefore reduced to a perfect system of trade and manufacture, the curer encouraging the fisherman by giving him a steady market at a fixed price, without any delay, for his fish, and the fishermen encouraging the curer to enter into enterprises of this kind by giving him the fish at the fixed price. Each party, therefore, knows what he is about when beginning to work.

Without this system of contract between fisher and curer it must be manifest that curing never could be carried on to any great extent; and were the curers in Scotland subject to the fluctuations in price, as in Ireland, by the fish being sold daily by auction to the highest bidder, the whole trade would likely soon break down; and should the branding system ever be adopted in Ireland, a great drawback to its success of development must follow if the Irish fishermen would not adopt such a system of sale by contract. As long, however, as fresh fish in Ireland is of such commercial value as it is at present, and has been for many years, the Irish fishermen will not be likely to abandon their present system of endeavouring to obtain the highest price they can, daily, for their fish. Nor are they to be blamed for endeavouring to obtain the highest price they can for the produce of their labour. The prices obtained for the herrings caught on the east coast of Ireland in summer, and sold fresh in Ireland, Glasgow, and Liverpool, are a good deal in excess of the prices obtained by the fishermen in Scotland by their contracts. I had not time to visit Liverpool to get information from the merchants there, who do a large trade with Ireland during both the summer and winter herring fishing. I may have an opportunity of doing this before the next winter's fishing sets in.

The boats used in the herring fishing on the East Coast are from 15 to 20 tons, lugger rigged, are generally owned by two or three fishermen, and are worth, with all nets and gear found, about 350 *l.* They generally carry five men and a boy, the extra hands being employed on shares. In Wick there is some exception to this, and it has been stated to me that one of the causes of Wick not being so successful a station as others, is, the different manner in which the fishermen are employed, viz., being partly on wages, as also being to some extent occupiers of land, as well as fishermen.

Some of the boats shoot as many as 50 pieces of nets, of about 60 yards long each, or, when mounted on back rope, 38 yards of 18 score of meshes deep, and have their nets weighted with stones, so as to keep them perpendicular, and consequently more efficacious in capture. They fish, according to circumstances, from 10 to 40 miles off shore.

When the fish are brought to land, and delivered to the curer, should he require them to be branded when cured, they must be all gutted with the knife, and cured within 24 hours of capture. The curer is then bound to give notice on the printed Form (No. 5) supplied for that purpose to the fishery officer, that he has so many bushels of salt stored, and that he intends to proceed with the curing of herrings from that date. While this is going on the fishery officers are constantly on the move, going about and inspecting the work. When the curer has a certain quantity ready, he is obliged to send a return to the fishery officer on the Form No. 6, and make a declaration as to the accuracy of the return. All the fish, though purchased by the cran, must be cured, if in barrels or half barrels, by the barrel of the standard size, or if in bulk, by the cran. On this latter form the curer must declare to the number of barrels originally cured in barrels for the official brand, that is, gutted with a knife, and packed within 24 hours after being taken; the number of barrels not for the official brand, that is, gutted and packed in barrels not within 24 hours after being taken; the number ungutted, and the number of crans originally cured in bulk, and the marks on the barrels. The barrels on first heading up are called *sea sticks*. The barrels with the cured fish must then be laid up for 10 or 12 days, opened again, pickle poured off, and barrel filled up with herrings from other barrels, and when they are thus filled, they are what is termed "*bung-packed*."

A request note is then sent by the curer (Form No. 7) to the fishery officer, that he has ready, "*bung-packed*," so many barrels and half-barrels ready for branding, and with this note is accompanied the deposit fee of 4 *d.* per barrel. The officer then attends the curing store with his branding irons, the curer supplying the fire and any labour necessary, and opens as many barrels as he may

may consider desirable, perhaps, on an average, 1 in 10, but more, if he thinks it necessary, and makes a note of those opened and rejected by him, and the reasons for rejection, and returns to the curer any fees he may have received over and above the number of barrels that have been branded. After branding, the curer is bound not to interfere in any way with the herrings so branded, unless in the presence of the fishery officer, or unless it may be necessary to open a barrel for the satisfaction of an intending purchaser. If the curer interferes with the herrings without notice to the fishery officer, or his inspection, or if the fishery officer considers that the herrings have been prejudicially interfered with, he is entitled to remove the brand from the barrels.

When the curer is ready to export his fish, he must give notice of his intention to do so on the printed Form No. 14, and the officer signs this return, which shows the quantity in barrels of the different kinds shipped, thus: Full-branded; Matties; Spents; P., or P.P.; Gutted, not Branded; Ungutted; and crans in bulk.

The quantity cured in Scotland in the year 1875, was	942,980	barrels.
Of this the quantity branded was	523,789½	„
Leaving the quantity unbranded	419,190½	„
Out of these there were cured on the West Coast, and not branded	100,957½	„
The quantity cured on East Coast was	842,022½	„
Out of this quantity there were branded	523,789½	„
Leaving unbranded on East Coast	318,233	„
To which if unbranded from West Coast be added	100,957½	„
Will leave total unbranded, of	419,190½	„
Against the quantity branded of	523,789½	„

or 104,599 barrels branded more than unbranded, out of a total quantity of 942,980.

The exports were—		
To Continent	627,536½	barrels.
To Ireland	33,434	„
TOTAL	660,970½	„
Of the quantity sent to Ireland, viz.	33,434	„
There were branded, about	4,000	„
Leaving unbranded sent to Ireland	29,434	„
The home consumption amounted to	282,009½	„

A very small quantity only of branded fish is in demand for either exportation to Ireland or for home consumption. They are principally unbranded fish.

It has been asserted that fish are often sent from Ireland to Scotland, branded there, and returned to Ireland as branded Scotch fish. No reliance can be placed on such a statement, as from the requirements necessary to be complied with before the brand can be applied to any cured fish, it would be impossible that this could be done. Firstly, the brand is only applied to herrings cured on the East Coast, and these must be cured within 24 hours after being taken. Secondly, if herrings not caught in the officer's division, where the brand is sought, they must be accompanied with a certified copy of the declara-

tion that they were cured within 24 hours after being caught, and the certificate from the officer in whose district they were caught that they were so cured, so that in no case, unless the fishery officer committed a fraud, could herrings sent from Ireland receive the official brand.

A quantity of herrings is exported to Scotland and England from Ireland, not only cured, but in packages, simply salted. These are all sold in the home markets The latter are designated and sold for fresh herrings, as they are only slightly salted, and bring a high price as such, particularly in the Glasgow market. The Glasgow merchants say that they would cure in Ireland a much larger quantity than they do at present if they could get them at a price to remunerate them; but that they can only get them occasionally when there is a great glut, and prices fall. They further say that the herrings caught on the East Coast of Ireland in summer are too rich to cure for the continental market, as they will not keep over for any time, and that parcels of Irish-cured fish sent to the continental market did not pay the expenses; with regard to the winter-cured fish, that the quality is not good enough, much of it being spent and mixed fish. I am of opinion that whether the brand be applied to Ireland or not, it would be well to test the accuracy of these allegations which may be easily done at an inconsiderable expense by having, say, a score of barrels of fish in winter and summer cured at Arklow, Howth, and Ardglass by one of the best Scotch curers that can be obtained, and that they should then be sent to the Continent for sale. This would test the value of Irish-cured fish, as compared with Scotch fish, both unbranded.

As I said in the previous part of this Report, the West Coast of Scotland curers do not brand their fish; firstly, because if they did, it would be necessary for them to keep them over for a certain number of days before they could be branded, whereas now, the fishing being earlier than that of the East Coast, they are enabled to cure and send them off at once without any delay, and get the advantage of turning over their money quickly, having their fish also in the market at an earlier season when fish is scarce on the Continent, and bring an enhanced price; and secondly, the curers are well known, and sell the fish by their own private brands. This also occurs with many curers in the East Coast, who allege that the brand is of no use to them; that they, through their own names, are able at all times to obtain a higher price for their fish than others whose herrings have also received the official full brand. The early fishing on the West Coast, and the demand for fish on the Continent at that time, greatly obviate the necessity of the brand, as I had an instance of when in Wick, as I was informed by a gentleman who exports cured herrings, that he had on that day given as much as 4 *l.* 2 *s.* 6 *d.* a barrel for cured fish from the West Coast, to send to the Continent, the price then on the Continent being 5 *l.* to 5 *l.* 10 *s.* a barrel.

The average price obtained by the curers on the Continent is 31 *s.* 6 *d.* a barrel for full-branded fish; matties and spent about 10 *s.* a barrel less. Some years ago they brought as high as 36 *s.* a barrel.

The expense of curing a barrel of herrings, including barrel, is about 9 *s.*

The profits in the business really arise from the difference between the cran by which they are purchased and the barrel by which they are sold.

The average price of herrings for the last three years on the quay of Howth was 23 *s.* per mease, or equal to 1 *l.* 16 *s.* per cran.

This price (23 *s.* per mease) would be equal to about 30 *s.* per barrel of 800; add cost of curing, say 9 *s.* per barrel, and the cost would be over the average price obtained on the Continent for best-cured fish, exclusive of the expense of freight, commission, &c., so that the fish sold on the quay of Howth, fresh, for the last three years, have brought about 14 *s.* a cran, or 11 *s.* 8 *d.* a barrel more than the Scotch fish.

At Ardglass the average price for the last three years was 18 *s.* 1 *d.* per mease, which would be equal to 28 *s.* 3 *d.* per cran, or 23 *s.* 6 *d.* per barrel, and when cost of curing added would be higher than the average price on the Continent, exclusive of freight and commission.

Here, again, the Irish fresh fish has a greatly enhanced value over the Scotch fish, as much as 6 *s.* per cran.

The average price at Arklow for fresh herrings for same period was higher than at either Howth or Ardglass, being as near as possible 23 *s.* 6 *d.* per mease.

I have

I have taken the three principal places in Ireland for the capture of herrings in drawing these comparisons.

If the price of fresh fish continue as high in Ireland as it has done for the last three years it will be seen that curing would not pay, and that until the capture exceeds the home demand, the branding would not be of any use, in my mind, in the present state of the trade in Ireland. This is the conclusion I am forced to come to after a very close examination of the whole matter in Scotland.

The value of the brand in Scotland has been for some years, and is at present, a vexed question among the curers. To the large curer, whose private brand is well known on the Continent, it may not be of the slightest consequence. They can, as they allege, carry on their trade perfectly irrespective of it, and indeed they go so far as to say that it prevents any improvement in cure, as no matter what improvement they may make, their herrings receive no further mark of approval from the official brand, than others of inferior cure, though the latter are up to the standard, and they must then fall back on their own private brand for any increased value. This class, generally speaking, would like to see the brand abolished.

To the small curers and to those whose private brands are not well known in the market, the official brand is of the greatest consequence, and is, as it has proved, a great stimulant to the trade of curing on the East Coast, while the fees derived from it not only defray all the expenses connected with it, but, in addition, form a very large revenue towards the other expenses of the Fishery Board in Scotland.

It certainly, as far as I could learn, does not prevent differences arising between seller and continental buyer when there is a fall in the markets, though the fish may be sold and branded as full crowns.

Its abolition, however, would now, in my mind, revolutionise and probably prejudice the trade, and create a monopoly for the few, while its continuance may have the effect of still further developing the trade, which has reached such enormous commercial value in Scotland.

I should not in this respect be considered as intending to say more than, that under the present system of selling fish in Ireland by auction, or at the day's price, curing of herrings cannot in my mind be carried on to any great extent, and advantages to be derived from the branding would be confined to the curers who cure these small parcels of fish, and therefore would not be equivalent to the expense of applying it to the small quantity cured.

In the early part of the year, before the season commences in Scotland, and when fish are scarce on the Continent, and bring very high prices, and in the winter, it might be the interest of curers to cure for the foreign markets, if a sufficiently large quantity were captured, and that the fish was of a quality to take the cure required. In such case the brand would be advantageous in facilitating the sale of the fish on the Continent, and it would, so cured, bring high prices.

The quantity captured at those times at the principal stations, Howth, Ardglass, and Arklow, is however only comparatively small, while the prices obtained for the herrings fresh are large.

The quantity captured in the early summer fishing, before the Scotch fishing commences, and the prices obtained at the stations named, on an average for the last three years, were :—

	Mease. Average Price.	Barrels. Average Price.	Crans. Average Price.
At Howth -	22,441, at 27/6 -	about 17,813, at 34/8 -	about 14,845, at 41/7.
At Ardglass -	14,155, at 20/6 -	about 11,236, at 25/10 -	about 9,363, at 31/.
At Arklow -	13,502, at 31/6 -	about 10,717, at 39/8 -	about 8,931, at 47/7.

A good deal of this fish is reported as "small and mixed."

The winter's fishing, and the prices obtained at same stations for same time, were, on an average, as follow :—

	Mease. Average Price.	Barrels. Average Price.	Crans. Average Price.
At Howth -	12,256, at 22/9 -	about 12,256, at 22/9 -	about 10,214, at 27/4.
At Ardglass -	11,975, at 20/10 -	about 9,505, at 26/3 -	about 7,921, at 31/6.
At Arklow -	9,048, at 19/3 -	about 7,182, at 24/3 -	about 5,985, at 29/1.

The most of the fish captured at this time is reported to be "mixed fish," and consequently even if fit to be cured for the foreign market, would be of considerably less commercial value than the full fish which would obtain the full Crown brand.

The expense of freight to the Baltic from Ireland is, I am informed, about 15 *s.* a barrel, so that on the whole there is little prospect of Irish-cured fish being able to compete in the foreign market with Scotch-cured fish.

17 August 1876. (signed) *Thomas F. Brady.*

IRISH FISHERIES.

COPY of the REPORT of the INSPECTORS of IRISH FISHERIES, dated January 1877, on the Subject of BRANDING HERRINGS in *Ireland* and *Scotland*, and referred to in the Report of the Inspectors for 1878.

(*Mr. O'Shaughnessy.*)

Ordered, by The House of Commons, *to be Printed,* 8 *August* 1879.

351.

Under 1 *oz.*

15

REPORT

BY THE

COMMISSIONERS OF THE FISHERY BOARD: SCOTLAND:

OF THEIR PROCEEDINGS

IN THE YEAR ENDED 31ST DECEMBER 1878.

BEING FOR FISHING 1878.

Presented in pursuance of Acts 48 Geo. III. c. 110, sect. 7, and 55 Geo. III. c. 94, sect. 4.

The Returns of the Herring Fishery of Scotland for the year 1878 are—

Barrels Cured.	Barrels Exported.	Barrels Branded.	Brand Fees.
905,768	628,934	456,708	£7611, 16s.

They prove the fishing of the year to have been remarkably good, and so much above an average fishing as to have been exceeded only by the great fishings of the years 1873, 1874, and 1875. A considerable increase was made upon the returns of the previous year, and a still greater upon an average taken over the ten years ending 1877. The increase was—

OVER THE PREVIOUS YEAR.

Barrels Cured.	Barrels Exported.	Barrels Branded.	Brand Fees.
58,049¼	66,948¼	58,913	£981, 17s. 8d.

OVER AN AVERAGE OF THE TEN YEARS.

Barrels Cured.	Barrels Exported.	Barrels Branded.	Brand Fees.
98,309	87,877	91,695	£1528, 5s.

being equivalent to an increase—

OVER THE YEAR 1877.

In the quantity	cured,	nearly	7 per cent.
Do. do.	exported,	„	12 „
Do. do.	branded,	„	15 „
Do. ——	brand fees,	„	15 „

OVER THE AVERAGE OF THE PRECEDING TEN YEARS.

In the quantity	cured,		12 per cent.
Do. do.	exported,		16 „
Do. do.	branded,		25 „
Do. ——	brand fees,		25 „

[C.—2366.] *Price 4d.*

In 1878 the proportion of full fish was greater than in 1877, and the quality of the herrings upon the whole better. Of the export of 628,934 barrels, nearly 97 per cent. went to the Continent, which shows how dependent the herring trade of Scotland is upon the markets there; and, in prospect of the fishing of 1879, it is satisfactory to be able to state, that little or none of this large export remains unconsumed, so that the produce of 1879 will not have to contend against old stocks on hand.

The districts upon the east coast where in 1878 the fishing was most abundant were Peterhead, Fraserburgh, and Wick. It exceeded that of 1877—

At Peterhead, by	51,953 barrels.
„ Fraserburgh, by	50,322 „
„ Wick, by	45,102 „

The excess at Wick is marked by the circumstance that there were no less than 123 fewer boats fishing in that district in 1878 than in 1877—the relative number of boats for the two years being—

In 1878,	579 boats.
„ 1877,	702 „

Fewer boats fished in Wick district in 1878 than has been known for forty years; but the average catch per boat was the highest Wick has seen in that period, the average having been 145 crans per boat as against 68 in 1877. The increase in the fishing of 1878 over that of 1877 proceeded from the fishing upon the east coast and chiefly from the three districts referred to, none of the other districts having produced anything like the large increase which marked those of Peterhead, Fraserburgh, and Wick, although Orkney and Shetland had both what are reckoned good fishings for those districts. Upon the west coast there was a considerable falling off in the fishing, the early fishing in the Hebrides having been prosecuted by 215 fewer boats than in the previous year, the relative numbers for the two years being—

In 1878,	871 boats.
„ 1877,	1086 „

indeed, the number of boats fishing there in 1878 was less than in any year during the last twelve years: this arose from unwillingness on the part of curers to embark in the adventure in consequence of doubt as to peace being maintained in Europe and apprehension of instability in the markets of the Continent. In the districts which lie within the neighbourhood of the Clyde, the district of Inverary, which embraces the herring fishing of Loch Fyne, made but a poor return, as it has done for several years past; the adjoining district of Campbeltown, however, had a good fishing, and all but equal to that of 1877; while at Ballantrae, on the coast of Ayrshire opposite, the fishing of 1878 was the largest which has been known. The differences of increase or decrease in the other west coast districts were slight, with exception of Loch Carron district, where the fishing exceeded that of 1877 by 4000 barrels.

No event calling for special remark occurred during the fishery, the season not being so much disturbed by storms as the seasons of 1876 and 1877. In some places where the yield was deficient, complaint was made that the water was too still from the weather being too fine; and there is no doubt that the fishing-boats escaped almost entirely from that detention on shore by violent and contrary winds to which they were so much subjected in the two seasons referred to.

During the last few years a larger class of boats has been gradually introduced, and indeed attempts have been made to apply steam to the boats, but hitherto without that measure of success which had been anticipated from it. Upon the east coast of Scotland some of the boats have, in form, construction, and outfit, reached nearly the perfect model of a boat designed for fishing successfully under the condition of propulsion by sails and oars; but it must not be overlooked that the use of boats of larger size and drawing more water diminishes the number of hours during which they can leave, or return to, the tidal harbours on the coast, consequently in unsettled weather fishermen with large boats are deterred from going out to sea from fear of being forced to return before there is sufficient water to admit of their re-entering the harbour. The creation of a harbour of refuge in some central position to which they could run for shelter at all times of tide would cause a feeling

of security, and would enable the fishermen to go to sea on many occasions when now they are unable to do so.

As regards insurance of fishing-boats:—this is now becoming very general, boat clubs having been instituted by fishermen and others for the purpose. A few years ago no such club existed; but the ordinary marine insurance societies having always declined to take the risk of insuring fishing-boats, the fishermen and their friends directed their attention to undertaking insurance of the boats by means of a mutual club. In the Board's Report for 1876 the institution at Anstruther of the East of Fife Mutual Insurance Boat Club was alluded to, which, it is believed, was the first of the kind formed. It has been followed by the institution at Fraserburgh of the North East of Scotland Boat Insurance Company, and in course of time perhaps more of these clubs or companies will be formed. The value of fishermen's property at sea is now so much increased that the establishment of insurance funds is matter for congratulation as a sign of the advance made by the fishing population in foresight and prudence.

The number of applications made through the Board's officers to register fishing-boats under the Sea Fisheries Act, 1868, was 588; of registers issued through them, 596; and of registers examined and endorsed by them, 5120. These numbers are a reduction upon those of previous years, which arises from the action of Additional Regulation No. 1 for sea fishing-boats issued under Order in Council of October 1877. By this Additional Regulation many fishing-boats of the minor class upon the coasts of Scotland are exempt from the obligation of being registered, lettered, and numbered; this, besides breaking up the uniformity of system which previously subsisted, opens the door for depredations to be carried on without discovery in the narrow waters which such boats frequent, and has been complained of in the oyster fisheries of the Firth of Forth as well as elsewhere. The Board of Trade are applying to fishing-boats the compulsory obligation under the Merchant Shipping Act of being provided with lights and fog-signals. This compulsion is a wise and necessary precaution upon coasts like those of Scotland, where there is unceasing traffic of vessels day and night, most of them pushing rapid passages under steam, and the Fishery Board, through their officers, are co-operating with the Board of Trade in impressing upon fishermen the necessity of complying with this obligation.

From the weekly returns of the weather and of the fishery made for the Meteorological Society of Scotland by the officers of the Fishery Board, Mr Buchan, the Secretary of the Society, has made the deductions which are given in the following Report:—

Extract from Report of the Scottish Meteorological Society on the Herring Fishings of 1878:—*June* 1879.

"Treating the whole of the east coast of Scotland as one as regards the influence of temperature "on the catch of herrings off that coast during July, August, and September 1878, it is seen that the "temperature of the first week of the season, being the second week of July, was about, or only "slightly above, the average, and the catch of herrings was decidedly above the average; on the week "following the temperature rose very high, and the catch of herrings was much below the average; "from this time to the end of the month temperature fell greatly and continued to fluctuate about "the mean, and the catch rose generally, amounting on the 25th July to an average catch of 11·63 "crans per boat out fishing on the east coast, which is nearly double the average catch; in the "beginning of August temperature rose, and the catch fell; from the 13th to the 23d temperature "fell, and continued to fluctuate below the average, and with this low fluctuating temperature the "catch rose considerably above the average; from this time to the close of the season temperature "rose considerably above the mean, and remained high, and the catch fell very greatly below the "average. It will be seen from these results that the relations pointed out in the Reports of the "previous five years as subsisting between the temperature and the catch of the herrings were entirely "confirmed by the fishings of 1878.

"It is to be noted that the high temperatures referred to as having occurred from 15th to 20th "July were not felt in an equal degree along the east coast, being much greater to south of the Moray "Firth than in more northern districts. During this week the mean catch per boat was 3·4 crans "at Eyemouth, 4·3 crans at Aberdeen, 4·4 crans at Peterhead, 5·4 crans at Fraserburgh, but 8·8 crans "at Wick where the temperature kept much lower. The catches of the week following in their "relation to the sea temperatures observed on the fishing grounds by the fishermen were—temperature "of sea 59°·6, and 2·9 crans at Eyemouth; 58°·8, and 2·5 crans at Anstruther; 57°·1, and 4·5 crans at "Aberdeen; 57°·7, and 5·2 crans at Peterhead; and 54°·9, and 5·9 crans at Wick. In this week the "catch at Fraserburgh rose to a mean of 14·6 crans, with a sea temperature of 56°·7.

"The mean catch per boat out for each of the past six fishing seasons was 6·04 crans in 1873, "6·02 crans in 1874, 6·16 crans in 1875, 4·66 crans in 1876, 5·56 crans in 1877, and 5·43 crans in "1878. Hence the mean catch for 1878 was the second lowest of the six, which is probably due in

" a large degree to the great warmth of the season and the comparative failure of the fishings in " several of the districts. At Wick, however, the mean catch in 1878 was the largest during the six " years, these having been 4·61, 4·19, 5·64, 4·34, 3·71, and 6·27 crans.

" The large, or comparatively large, catches in Shetland, Orkney, Wick, and round the coast from " Rosehearty to Anstruther, and the small catches in the Moray Firth from Lybster to Buckie and " south of the Firth of Forth in their relation to the remarkable temperature of 1878 and its irregular " distribution at different critical times of the herring season would form an interesting subject of " inquiry, likely to throw a good deal of light on the movements of the fish. Further, the generally " high temperature of the sea during 1878 as compared with its low temperature during 1877 might " be expected to furnish data for the elucidation of the important question as to the degree of " temperature of the sea at which the largest catches of herring are usually taken off the east coast— " a question to which the Dutch fishermen have given a good deal of attention. To work out these, " and some of the other more important problems of the herring fisheries, it would be necessary to " construct at least about 200 temperature and weather maps, on which would also be shown the " catches of herring from day to day at different points along the coast. The material for this " large undertaking has been to no inconsiderable extent collected by this Committee in conjunction " with the Commissioners of the Fishery Board, but the means at the disposal of this Society has " hitherto prevented the carrying out of its discussion. The Committee hope, however, to be able to " overtake a portion of this large discussion in time for their next Report.

" Alexander Buchan.
" *Secretary Scottish Meteorological Society.*"

A winter fishing for herrings is carried on in the following places:—In Firth of Forth, in Firth of Tay, in the Beauly Firth, and upon the coast of Caithness from Wick south to Helmsdale. At all these places, except upon the coast from Wick to Helmsdale, the herrings proved deficient in quantity and generally poor in quality. In the Firth of Forth the return from this fishery, alike in the districts of Leith and Anstruther, was trifling, the herrings proving so scarce in Anstruther district that the catch was the smallest on record for the last 25 years; and in Leith district, besides being scanty in number, the herrings were inferior in quality: in Firth of Tay the frozen snow and ice from the river prevented fishing of any kind; and in Beauly Firth the catch of herrings was quite insignificant. But on the Caithness coast better success was met with: at Lybster during the month of January, wherever netting was set good takes of herrings were got, the best not more than a hundred yards from the shore, yet at this station the summer herring fishing had failed; off Helmsdale likewise good takes were made; and if so much cannot be said for Wick, still a fair fishing was got there. The profits, however, of the northern winter fishery were unfortunately diminished by blocks of snow suspending from time to time the railway traffic—a traffic which has proved of great service to fishing enterprise on the coast of Caithness.

The fishing for sprats is confined almost entirely to the Firth of Forth and the Beauly Firth. In the Firth of Forth the sprats proved so inferior in quality that although considerable numbers were taken they could not compete in the food markets with those from the Beauly Firth, which were excellent and of full size, as also so abundant that the fishery yielded a rich harvest, not alone in those sent to market, but in the profuse supply which was obtained of the finest bait for long line fishing. The good quality of the sprats and their remarkable abundance here was attributed by several persons to severe frost preventing the rivers from coming down in flood into the firth.

The cod and ling fishery of 1878 was not equal to that of 1877; but the fishery in 1877 was exceptionally good. Iceland appears to be a more reliable field for it than either Faroe or Rockall, for the vessels which go to Iceland generally do well, whereas those that go to Faroe and Rockall too frequently meet with disappointment. At Stornoway and upon other parts of the west coast of Scotland the fishery did better in 1878 than it had done in 1877; but not so upon the east coast, where the outcome of the districts of Wick, Orkney, and Shetland proved short. The difference, however, between the produce of the two years is not considerable, being only 3391 cwt. of dried fish.

The attention of fishermen has been drawn, in several cases no doubt painfully, to the practice of beam-trawling upon the coasts. Beam-trawling has always been objected to by line and net fishermen because of the risk of injury to which it exposes their lines and nets, and also because the quantity of fish which trawling brings into the market lowers the price of what is brought in by line and net. In the case of fishermen fishing with drift nets, whether for mackerel, herrings, pilchards, or any other fish for which a drift net is used, the 15th article of the fishery convention with France, embodied in the Sea Fisheries Act, 1868, provides that—

"Trawl boats shall not commence fishing at a less distance than three miles from any boat "fishing with drift nets.

"If trawl boats have already shot their nets, they must not come nearer to boats fishing with "drift nets than the distance above mentioned."

No similar provision exists as towards line fishermen, and except in daylight and on grounds where large fleets of drift net fishermen are assembled, this article is one which it is very difficult to enforce; where drift net fishermen shoot their nets singly it may be said to be impossible to secure to each and all of them adequate protection. The grievances of line and net fishermen are therefore often considerable and loudly expressed; they were represented by much evidence given before the Sea Fisheries Commission of 1866, the result produced being upon the whole unfavourable to restrictive legislation, although hardship upon individuals was admitted as being of not infrequent occurrence. That Commission in summing up their conclusions hereon stated—

"The prohibition of one method of fishing on account of its interference with another, could only "be justified on the ground that the latter method yielded a far more valuable supply of fish to the "community than the former. . . . No one has any vested right or exclusive interest justifying him "in so occupying the sea as to prevent others from fishing in his vicinity. For example, if a line "fisherman shoots a line of three miles, he has no right to say that no trawler shall work near it so as "to run the chance of working over it or destroying it; he lays his line at his own risk, with the "knowledge of the danger, and subject only to a remedy at law if it can be shown that the trawler "wilfully or negligently damaged it."

Since then the line and net fishermen find their position made worse by beam-trawling being carried on upon some parts of the coast by steam-tugs, the tug taking the place of the sailing trawler, and of course traversing a wider range of fishing ground than she is able to do. The irritation between the parties which always prevailed has therefore become deeper, and goes to the point of disputing right to the sea and its produce, and the question has been considered by Her Majesty's Government of sufficient consequence for the appointment of a special commission of inquiry to examine into it. This Commission, consisting of Francis Trevelyan Buckland, Esq., and Spencer Walpole, Esq., have taken evidence in various localities from all parties concerned, and from the experience in sea fisheries possessed by the Commission the conclusions to which they may come are sure to be of value and are waited for with anxiety.

The Lords Commissioners of the Admiralty assigned H.M.S. "Jackal," Lieut.-Comr. H. A. Digby, to the protection of the herring fisheries upon the east and west coasts of Scotland; and further assigned to the east coast during the herring fishing season the following tenders attached to the "Lord Warden," guardship in the Firth of Forth; H.M.C. "Eagle," Mr Wm. Surry, afterwards succeeded by the gunboat "Firm," Lieut.-Comr. Henry J. Robilliard; and H.M.C. "Squirrel," Mr W. H. Williams; and for the Northumberland coast their Lordships assigned the gunboat "Ariel," Lieut.-Comr. H. A. Wilding, afterwards succeeded by H.M.C. "Active," Mr A. White. The "Vigilant" cruiser belonging to the Board was likewise superintending upon the fishing grounds both on the east coast and the west. The vessels composing the large fishing fleets from France which assemble every year at the herring fishery of the east coast keep at a greater distance from the shore than they did formerly, which has diminished the number of disputes between the fishermen of the two nations; still, in the course of the season, encroachments upon the three mile territorial boundary occur, and fouling of nets, in which from the heavier gear of the French the British fisherman suffers more damage than the French; hence nets are often cut, sometimes from temper and jealousy, but sometimes with the object of carrying off both the net and the fish in it. In the adjustment of such cases and their prevention so far as possible, the Board received the cordial assistance, not only of the commanders of the cruisers referred to, but also of Captain L. Borius, commanding the French Aviso "Le Cuvier," the commandant superintending the French at the fisheries in the Channel and in the North Sea, who was always ready to give his co-operation in the detection of offenders and the checking of brawls.

Fishery barometers, through the kindness of the Meteorological Department, London, have been supplied in the course of the year to the fishing creeks of Muchalls in Kincardineshire and Port Errol in Aberdeenshire, where they were received with gladness and gratitude. A considerable number of these excellent instruments have now been deposited by the Department upon the coasts of Scotland; they are highly prized by the fishermen who, from possession of them, have been brought into a fixed habit of watching and studying the indications of weather and the warnings they give, with no doubt in many cases a saving both of life and property.

The works of improvement at Burnmouth harbour, Berwickshire, which were stated in the Report for 1877 to have been commenced, have been successfully executed, a large extension of pier having been made in solid concrete; this has already proved a valuable protection for boats, but in heavy gales there is a run of sea round the pier head which Messrs D. & T. Stevenson, the engineers of the Board who designed the works, apprehended would be the case when the pier came to be completed. In presenting their original plan in 1858, they therefore warned the Board that it might be found necessary to add a breakwater to the works, which they sketched on the plan, but reserved its introduction until the effect produced from extension of the pier was practically ascertained. A breakwater is now seen to be required and arrangements are accordingly in progress for its erection; being a work of moderate extent and not in deep water, it will not cost much or be difficult of execution. The harbour of Anstruther, completion of which was intimated in the last Report of the Board to Parliament, has already proved of great service; the quays have been much used both by resident and stranger fishermen for landing fish; and on several occasions boats unable from the heavy sea to take Pittenweem, St Monance, or any of the neighbouring harbours, have found refuge in Anstruther and lain there in perfect safety. The works are standing well, and the protecting blocks of concrete have proved of the greatest service in breaking up the waves and diminishing the force of their stroke upon the wall of the east pier.

Subsequent to the date at which this Report closes, the Board have sustained a most severe loss in the sudden death from apoplexy of Samuel M'Donald, Esq., commander of the "Vigilant," whose valuable services have been often made the subject of notice in previous reports. From the zeal and activity he displayed in the execution of every duty committed to him, his earnestness in aiding fishermen and the intelligence and keenness of observation he brought to bear upon all questions relating to the fisheries, as also from his extended experience over the coasts of Great Britain and Ireland acquired in the course of a lengthened service in cruisers of the Coast Guard as well as in that of the Board, he possessed the entire confidence of the Commissioners, who deeply deplore his death in common with the many who knew and appreciated his worth.

The Accounts of the year's expenditure of the annual Pier or Quay Grant, with the Report of the Engineers, and the Returns and Statistics of the Fisheries for the year, will be found in the Appendix in the following order:—

HERRING FISHERY.

No. 1.—Account of Vessels fitted out in Scotland for the Herring Fishery, with the Herrings Salted or Cured on board;

No. 2.—Account of Herrings Cured or Salted on Shore in Scotland;

No. 3.—Account of the Total Quantity of Herrings Cured in Scotland;

No. 4.—Account of the Total Quantity of Herrings in Scotland Branded, with the Amount of Fees collected thereon;

No. 5.—Account of the Export of Herrings from Scotland; with a Supplementary Note showing, for the Export to the Continent, the Ports to which the Herrings have been Shipped;

No. 6.—Account of the Number of Cran Measures in Scotland adjusted and Branded;

Abstract of the Total Quantity of White Herrings Cured, Branded, and Exported, from 1st June 1809 to 31st December 1878; and showing the Export to Ireland, to the Continent, and to places out of Europe.

COD AND LING FISHERY.

No. 1.—Account of Vessels fitted out in Scotland for the Cod and Ling Fishery, with the quantity of Cod, Ling, and Hake they Cured;

No. 2.—Account of Cod, Ling, and Hake, taken by Open Boats at the Cod and Ling Fishery in Scotland, and Cured;

No. 3.—Account of the Total Quantity of Cod, Ling, and Hake taken both by Vessels and Open Boats at the Cod and Ling Fishery in Scotland, and Cured;

No. 4.—Account of the Export of Cod, Ling, and Hake from Scotland;

Abstract of the Total Quantity of Cod, Ling, and Hake Cured and Exported, from 10th October 1820 to 31st December 1878.

FISHERY STATISTICS.

No. 1.—Account of Boats, Men, &c., employed at the Herring Fishery in Scotland, in one selected week for each District;

No. 2.—Account of Boats, Fishermen, &c., with the Estimated Value of Boats, Nets, and Lines employed in the Herring and Cod and Ling Fisheries of Scotland;

No. 3.—Account of the Tonnage of Shipping, and Number of Seamen employed in the Herring and Cod and Ling Fisheries of Scotland;

No. 4.—Abstract of Tonnage of Vessels and Boats; and of the Number of Seamen, Fishermen, and Persons employed in the Herring and Cod and Ling Fisheries of Scotland.

Report by the Engineers upon the Harbour Works in progress under the Fishery Board: Scotland.

General Account of the Expenditure on Harbours, Piers, or Quays.

Abstract of Expenditure upon each Harbour.

SUMMARY.

Upon comparing the Accounts of 1878 with those of 1877, it will be seen,—That in the Herring Fishery the total quantity of Herrings cured in 1878 was 905,768 Barrels; the total quantity branded, 456,708 Barrels; and the total quantity exported, 628,934 Barrels; being an increase over the preceding year of 58,049¼ Barrels in the quantity cured, of 58,913 Barrels in the quantity branded, and of 66,948¼ Barrels in the quantity exported.

That in the Cod and Ling Fishery 183,809¼ cwts. were cured dried, and 9219 Barrels cured in pickle; and that the quantity exported was 94,969½ cwts. cured dried; being a decrease from the preceding year of 3391¼ cwts. in the quantity cured dried, but an increase of 599½ Barrels in the quantity cured in pickle, and of 21,601 cwts. cured dried in the quantity exported.

That the number of Fishing-Boats in Scotland was 14,431, and of Fishermen and Boys 46,529; and that the estimated value of the Boats, Nets, and Lines employed in the Herring and Cod and Ling Fisheries was £1,212,114, being a decrease from the preceding year of 192 Boats, but an increase of 639 Fishermen and Boys, and of £33,702 in the estimated value of Boats, Nets, and Lines.

CAITHNESS.
JAMES T. GIBSON-CRAIG.
ELCHO.
LYON PLAYFAIR.
GEORGE J. ALLMAN.
ALEX$^{R.}$ S. FINLAY.
GEORGE YOUNG.
FRANCIS ABBOTT.
JOHN DE COURCY AGNEW.
ROBERT DUNDAS.
W$^{M.}$ THOMAS THOMSON.
ALEX$^{R.}$ WOOD INGLIS.
DAVID MURE.
GEORGE WARRENDER.
ALEX$^{R.}$ H. GORDON.
W$^{M.}$ WATSON.
J. H. A. MACDONALD.

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

APPENDIX.

APPENDIX.

No. I.

ACCOUNT of the Number of VESSELS fitted out in SCOTLAND for the HERRING FISHERY, in the Year ended 31st December 1878; the Districts from which fitted out; the Tonnage and Number of Men; the Netting, Salt, and Barrels Shipped; and the Barrels of Herrings Cured.

DISTRICTS.	Vessels.	Tonnage.	Men.	Netting.	Salt.	Barrels.	Herrings Cured.				Total Cured in Vessels.
							Gutted.		Ungutted.		
							Gutted and Packed within 24 hours after being caught.	Gutted and Packed, but *not* within 24 hours after being caught.	Barrels.	Barrels of Bulk.	
	Number.	*Tons.*	*Number.*	*Square Yds.*	*Bushels.*	*Number.*	*Barrels.*	*Barrels.*	*Number.*	*Number.*	*Barrels.*
Stornoway,	10	447	51	...	10,350	3,639	2,841	...	798	1,859	5,498
Loch Broom,	8	112	40	60,000	505	286	286	...	...	9	295
Loch Carron and Skye,	36	608	110	294,000	8,058	4,074	2,650	...	295	158	3,103
Fort William,	11	176	36	74,000	1,000	854	171	...	...	...	171
Campbeltown,	4	56	15	16,000	440	197	187	...	...	30	217
Inverary,	44	722	197	361,000	5,190	1,885	2,258	...	...	1,397	3,655
Rothesay,	12	122	49	157,000	725	466	558	108	...	26	692
Greenock,	4	66	12	...	1,878	927	3,521½	...	149	168	3,838½
Ballantrae,	3	45	11	...	700	360	290	...	...	60	350
Total,	132	2,354	521	962,000	28,846	12,688	12,762½	108	1,242	3,707	17,819½

Note.—The above 132 Fishing Vessels made 148 Voyages.

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

No. II.

ACCOUNT of the Number of Barrels of WHITE HERRINGS Cured or Salted in SCOTLAND by Fish-Curers on Shore, in the Year ended 31st December 1878; and the Districts in which Cured, distinguishing the Herrings Cured Gutted from those Cured Ungutted.

DISTRICTS.	Herrings Cured Gutted.		Herrings Cured Ungutted.		Total Cured on Shore.
	Gutted and Packed within 24 hours after being caught.	Gutted and Packed, but *not* within 24 hours after being caught.	Barrels.	Barrels of Bulk.	
	Barrels.	*Barrels.*	*Number.*	*Number.*	*Barrels.*
Eyemouth,	4,887	...	3,250	9,919	18,056
Leith,	...	...	365	...	365
Anstruther,	2,052	214	838	4,654	7,758
Montrose,	14,773	954	3,434	10,775	29,936
Aberdeen,	72,904	2,575	5,495	12,370	93,344
Peterhead,	168,184	650	3,910	2,590	175,334
Fraserburgh,	262,970½	2,123	407	1,132½	266,633
Banff,	18,520	172	293	...	18,985
Buckie,	3,347	...	343	...	3,690
Findhorn,	1,700	...	689	...	2,389
Cromarty,	844	...	...	45	889
Helmsdale,	10,938	4	660	1,714	13,316
Lybster,	9,245	...	1,172	...	10,417
Wick,	90,822	8,092	916	5,956	105,786
Orkney Isles,	17,340	491	...	...	17,831
Shetland Isles,	8,458	174	...	...	8,632
Stornoway,	49,635	...	419	8,438	58,492
Loch Broom,	2,970	...	...	440	3,410
Loch Carron and Skye,	1,716	...	863	...	2,579
Fort William,	1,513	...	448	...	1,961
Campbeltown,	61	...	...	18,126	18,187
Inverary,	327	...	...	9,818½	10,145½
Rothesay,	30	...	...	1,607	1,637
Greenock,	...	...	...	683	683
Ballantrae,	...	...	...	17,493	17,493
Total,	743,236½	15,449	23,502	105,761	887,948½

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

HERRING FISHERY ACCOUNTS.

No. III.

ACCOUNT of the Total Number of Barrels of WHITE HERRINGS Cured or Salted in SCOTLAND in the Year ended 31st December 1878; distinguishing the Herrings Cured Gutted from those Cured Ungutted.

DISTRICTS.	Herrings Cured Gutted.		Herrings Cured Ungutted.		TOTAL HERRINGS CURED.
	Gutted and Packed within 24 hours after being caught.	Gutted and Packed, but *not* within 24 hours after being caught.	Barrels.	Barrels of Bulk.	
	Barrels.	*Barrels.*	*Number.*	*Number.*	*Barrels.*
Eyemouth,	4,887	...	3,250	9,919	18,056
Leith,	...	...	365	...	365
Anstruther,	2,052	214	838	4,654	7,758
Montrose,	14,773	954	3,434	10,775	29,936
Aberdeen,	72,904	2,575	5,495	12,370	93,344
Peterhead,	168,184	650	3,910	2,590	175,334
Fraserburgh,	262,970½	2,123	407	1,132½	266,633
Banff,	18,520	172	293	...	18,985
Buckie,	3,347	...	343	...	3,690
Findhorn,	1,700	...	689	...	2,389
Cromarty,	844	...	...	45	889
Helmsdale,	10,938	4	660	1,714	13,316
Lybster,	9,245	...	1,172	...	10,417
Wick,	90,822	8,092	916	5,956	105,786
Orkney Isles,	17,340	491	...	...	17,831
Shetland Isles,	8,458	174	...	...	8,632
Stornoway,	52,476	...	1,217	10,297	63,990
Loch Broom,	3,256	...	...	449	3,705
Loch Carron and Skye,	4,366	...	1,158	158	5,682
Fort William,	1,684	...	448	...	2,132
Campbeltown,	248	...	...	18,156	18,404
Inverary,	2,585	...	...	11,215½	13,800½
Rothesay,	588	108	...	1,633	2,329
Greenock,	3,521½	...	149	851	4,521½
Ballantrae,	290	...	...	17,553	17,843
Total,	755,999	15,557	24,744	109,468	905,768

SUPPLEMENTARY NOTE

Showing the NUMBER of BARRELS of HERRINGS Cured or Salted on the West Coast of Scotland, in the year ended 31st December 1878; stated by the Districts where the Herrings were caught.

DISTRICTS.	BARRELS.
Stornoway,	69,320
Loch Broom,	3,941
Loch Carron and Skye,	6,596½
Fort William,	2,783
Campbeltown,	18,320
Inverary,	11,268½
Rothesay,	2,002
Greenock,	683
Ballantrae,	17,493
Total,	132,407

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

HERRING FISHERY ACCOUNTS.

No. IV.

ACCOUNT of the Total Number of Barrels of WHITE HERRINGS in SCOTLAND Branded in the year ended 31st December 1878; and of the Brandings in each District, distinguishing Herrings Bung-Packed from Herrings Re-packed; with Return of the Fees collected thereon under the Act 21 and 22 Victoria, cap. 69.

DISTRICTS.	Description of Barrels Branded.		
	Bung-Packed.	Re-packed.	TOTAL BRANDED.
	Barrels.	*Barrels.*	*Barrels.*
Eyemouth,	220	...	220
Leith,	194	...	194
Anstruther,	572	...	572
Montrose,	8,836½	...	8,836½
Aberdeen,	52,970½	...	52,970½
Peterhead,	109,783½	...	109,783½
Fraserburgh,	177,256	...	177,256
Banff,	12,216	...	12,216
Buckie,	2,720	...	2,720
Findhorn,	877½	...	877½
Cromarty,	466	...	466
Helmsdale,	8,864½	...	8,864½
Lybster,	8,064½	...	8,064½
Wick,	60,165½	...	60,165½
Orkney Isles,	7,356½	...	7,356½
Shetland Isles,	6,145	...	6,145
Total,	456,708	...	*456,708

* Of this number, 232,496 Barrels were Branded Crown "FULL."
" 127,129 " were Branded Crown "MATIES."
" 76,571½ " were Branded Crown "SPENT."
" 20,511½ " were Branded Crown "MIXED."
" " " were Branded Crown "RE-PACKED."

456,708 Barrels. The Fees thereon amounted to £7,611 16 0
Bank Interest, ... 0 13 9

Total Receipts, £7,612 9 9

NOTE showing the Total Number of Barrels in the foregoing Account Branded "FULL," "MATIES," or "SPENT."

DISTRICTS.	Number of Barrels Assorted and Branded.		
	Crown Full.	*Crown Maties.*	*Crown Spent.*
	Barrels.	*Barrels.*	*Barrels.*
Eyemouth,	64	113	43
Leith,	...	170	...
Anstruther,	180	219	105
Montrose,	2,964	2,545	3,212
Aberdeen,	19,276	14,459½	13,669
Peterhead,	53,749	32,975	23,024
Fraserburgh,	97,025	52,920½	21,278½
Banff,	5,826½	4,142½	1,579½
Buckie,	1,418½	1,066	183½
Findhorn,	705	72½	47
Cromarty,	315	131½	19½
Helmsdale,	6,036	1,697½	795½
Lybster,	4,662½	2,098½	1,268½
Wick,	33,093½	12,485	7,178½
Orkney Isles,	4,037½	2,033½	1,166½
Shetland Isles,	3,143½	...	3,001½
Total,	232,496	127,129	76,571½

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

HERRING FISHERY ACCOUNTS.

No. V.

ACCOUNT of the Number of Barrels of WHITE HERRINGS in SCOTLAND Exported in the Year ended 31st December 1878; distinguishing the Export to Ireland, to the Continent, and to places out of Europe; distinguishing also Herrings Cured Gutted from Herrings Cured Ungutted; and Herrings Bung-Packed from Herrings Re-packed.

DISTRICTS.	BARRELS OF HERRINGS EXPORTED.							
	To Ireland.			To the Continent.		To Places out of Europe.		TOTAL EXPORTED.
	Bung-Packed.		Barrels of Bulk.	Bung-Packed.		Bung-Packed.	Re-packed.	
	Gutted.	Ungutted.		Gutted.	Ungutted.	Gutted.	Gutted.	
	Barrels.	*Barrels.*	*Number.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
Leith,	201	...	...	22,781½	...	...	...	22,982½
Anstruther,	...	...	...	1,605½	...	...	...	1,605½
Montrose,	430	...	...	10,025½	422	...	...	10,877½
Aberdeen,	...	...	...	62,062	...	...	...	62,062
Peterhead,	...	...	...	135,505	...	...	...	135,505
Fraserburgh,	1,545	...	...	214,391	...	...	...	215,936
Banff,	...	...	...	13,994	...	...	...	13,994
Buckie,	...	...	...	2,520	...	...	...	2,520
Findhorn,	...	...	...	1,014¼	...	...	...	1,014¼
Cromarty,	135	...	...	...	...	...	...	135
Helmsdale,	...	...	...	10,566	...	...	...	10,566
Lybster,	...	...	...	7,712½	...	...	...	7,712½
Wick,	5,032½	371½	...	78,076	...	...	..	83,480
Orkney Isles,	7,354¼	...	...	6,739	...	...	...	14,093¼
Shetland Isles,	658	...	...	6,044½	...	...	...	6,702½
Stornoway,	...	...	...	29,900	...	...	...	29,900
Inverary,	45	...	...	...	...	...	...	45
Greenock,	1,673½	...	...	...	...	1,518	...	3,191½
Sent from Scotland to England, and thence Exported,	...	...	...	5,560½	50	...	1,001	6,611½
Total,	17,074¼	371½	...	608,497¼	472	1,518	1,001	628,934

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

SUPPLEMENTARY NOTE showing the Ports or Places to which the Herrings Exported to the Continent were Shipped.

DISTRICTS.	BARRELS OF HERRINGS EXPORTED.																
	RUSSIA.				GERMANY.									HOLLAND.		BELGIUM.	TOTAL Exported to the Continent.
	Odessa.	Petersburg.	Riga.	Libau.	Memel.	Königsberg.	Elbing.	Danzig.	Stettin.	Altona.	Hamburg.	Harburg.	Bremen.	Rotterdam.	Antwerp.	Ghent.	
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
Eyemouth,	...	...	...	...	...	...	...	110	...	...	...	...	...	...	...	...	110
Leith,	...	1,128	...	...	...	567	...	...	6,062½	...	14,139½	...	70	611½	35	168	22,781½
Anstruther,	...	...	...	...	...	...	...	...	1,605½	...	...	...	...	...	...	...	1,605½
Montrose,	...	...	...	...	...	1,316	...	6,814	1,978½	...	339	...	...	...	...	...	10,447½
Aberdeen,	2,485	...	...	3,304	2,371	12,169½	...	12,178	18,270½	1,586	11,883½	2,390	5	100	...	...	66,742½
Peterhead,	750	2,909	...	2,941	3,221	30,426½	...	29,742	46,311	...	16,776	2,798½	...	...	...	450	136,325
Fraserburgh,	...	3,542	2,633	19,054	3,840½	29,903½	1,086	14,269½	78,132½	747	39,080	19,939	1,764	...	...	400	214,391
Banff,	...	572	...	...	...	1,800	...	1,896	8,458	...	1,268	...	...	...	...	...	13,994
Buckie,	...	...	...	...	...	590½	...	...	1,687½	...	242	...	...	...	...	...	2,520
Findhorn,	...	275¾	...	...	...	216	...	...	522½	...	...	...	...	...	...	...	1,014¼
Helmsdale,	...	...	...	...	...	...	...	829	6,843½	...	1,802½	1,091	...	...	...	...	10,566
Lybster,	...	...	...	...	...	...	...	1,306½	3,924½	...	2,481½	...	...	...	...	...	7,712½
Wick,	...	3,000½	...	533	1,233½	3,685½	...	26,284	32,671¼	...	9,460¼	...	1,208	...	...	...	78,076
Orkney Isles,	...	...	...	...	...	...	...	2,549½	3,709½	...	480	...	...	...	...	...	6,739
Shetland Isles,	...	...	...	...	...	456	...	1,000½	4,588	...	...	...	...	...	...	...	6,044½
Stornoway,	...	17,386½	...	...	...	...	...	...	9,823	...	2,690½	...	...	...	...	...	29,900
Total,	3,235	28,813¾	2,633	25,832	10,666	81,130½	1,086	96,979	224,588¼	2,333	100,642¾	26,218½	3,047	711½	35	1,018	608,969¼

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

HERRING FISHERY ACCOUNTS.

No. VI.

ACCOUNT of the Number of Crans and Half Crans, adjusted as Measures for the Purchase and Sale of Fresh Herrings and Branded in SCOTLAND, in the Year ended 31st December 1878.

DISTRICTS.	ADJUSTED AND BRANDED.	
	Crans.	Half Crans.
Montrose	5	...
Peterhead	4	...
Total	9	...

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

ABSTRACT showing the Total Quantity of WHITE HERRINGS Cured, Branded, and Exported, year by year, *in so far as brought under cognizance of Fishery Officers*, from the 1st of June 1809 to the 31st of December 1878; distinguishing the Export to Ireland, to the Continent, and to places out of Europe.

PERIODS.	Total Quantity of Herrings Cured.			Total Quantity of Herrings Branded.	Total Quantity of Herrings Exported.			Grand Total Exported.
	Gutted.	Ungutted incl. Bulk.	Total Cured.		To Ireland.	To the Continent.	To places out of Europe.	
	Barrels.	*Bls. or Crans.*	*Barrels.*	*Barrels.*	*Bls. or Crans.*	*Barrels.*	*Barrels.*	*Barrels.*
Period extending from 1st June 1809 to 5th April 1810,	42,548	47,637½	90,185½	34,701	28,014	...	7,834	35,848
Year ended 5th April 1811,	65,430	26,397½	91,827½	55,662½	28,212	...	9,921	38,133
Year ended 5th April 1812,	72,515½	39,004	111,519½	58,430	30,417½	4,730	27,672½	62,820
Year ended 5th April 1813,	89,900¾	63,587½	153,488¼	70,027½	57,980	11,046½	40,699	109,725½
Year ended 5th April 1814,	52,931½	57,611	110,542½	38,184½	43,061½	23,943	51,399	118,403½
Year ended 5th April 1815,	105,372¼	54,767	160,139¼	83,376	49,635¾	35,891	55,778½	141,305¼
Year ended 5th April 1816,	135,981	26,670¾	162,651¾	116,436	29,456½	15,563	62,668½	107,688
Year ended 5th April 1817,	155,776	36,567½	192,343½	140,018½	36,341	44,432½	57,855	138,628½
Year ended 5th April 1818,	204,270¼	23,420¾	227,691	183,089½	53,386½	43,896	65,057	162,339½
Year ended 5th April 1819,	303,777½	37,116½	340,894	270,022½	89,704	52,333	85,125	227,162
Year ended 5th April 1820,	347,190½	35,301	382,491½	309,700½	101,109½	64,302½	88,104	253,516
Year ended 5th April 1821,	413,308	28,887¾	442,195¾	363,872	125,445	89,524	79,836½	294,805½
Year ended 5th April 1822,	291,626½	24,897¾	316,524¼	263,205½	102,719	34,752	77,485	214,956
Year ended 5th April 1823,	225,037	23,832	248,869	203,110	56,528	38,002½	75,914½	170,445
Year ended 5th April 1824,	335,450	56,740¾	392,190¾	299,631	116,747½	40,231	82,652	239,630½
Year ended 5th April 1825,	303,397	44,268¼	347,665¼	270,844½	96,409½	35,029½	70,577½	202,016½
Year ended 5th April 1826,	340,118	39,115¾	379,233¾	294,422½	121,386½	28,167¾	67,519	217,073¼
Year ended 5th April 1827,	259,171¼	29,324	288,495¼	223,606	78,735	16,701	70,970	166,406
Year ended 5th April 1828,	339,360	60,418	399,778	279,317½	109,108½	24,489½	78,061	211,659
Year ended 5th April 1829,	300,242½	55,737	355,979½	234,827	107,651	28,280½	69,944	205,875½
Year ended 5th April 1830,	280,933½	48,623½	329,557	218,418½	89,680½	24,302	67,672	181,654½
Year ended 5th April 1831,	371,096	68,274¼	439,370¼	237,085	130,300½	61,655½	72,947	264,903
Year ended 5th April 1832,	313,113¾	49,547	362,660¾	157,839½	128,458	31,100¼	57,941½	217,499¾
Year ended 5th April 1833,	353,684½	63,279¾	416,964¼	168,259½	114,137	47,556½	58,991	220,684½
Year ended 5th April 1834,	382,677½	68,853¾	451,531¼	178,000½	149,254	55,852	66,987½	272,093½
Year ended 5th April 1835,	217,242½	60,074½	277,317	85,079½	73,960	34,050	50,795½	158,805½
Year ended 5th April 1836,	399,334	98,280¾	497,614¾	192,317	168,960	48,451½	55,982	273,393½
Year ended 5th April 1837,	290,169	107,660¼	397,829¼	114,192	102,968½	46,777	39,520	189,265½
Year ended 5th April 1838,	382,400	125,374¾	507,774¾	141,552	139,095	57,388½	38,674½	235,158
Year ended 5th April 1839,	382,229	173,330¾	555,559¾	153,659½	149,926	64,870	24,934½	239,730½
Year ended 5th April 1840,	405,379½	138,565½	543,945	152,231	157,359	82,515½	12,647½	252,522
Year ended 5th April 1841,	431,157	126,105¼	557,262¼	154,189	150,517½	90,951½	8,668	250,137
Year ended 5th April 1842,	489,620½	177,624¾	667,245¼	190,922½	187,953	91,069½	5,713½	284,736
Year ended 5th April 1843,	442,290	181,129¾	623,419¾	162,713	165,327½	120,136½	6,336½	291,800½
Year ended 5th April 1844,	473,556¾	191,803	665,359¾	182,988	127,770	181,953	3,793½	313,516½
Period extending from 5th April 1844 to 5th Jan. 1845,	393,312	132,720¾	526,032¾	140,632	120,293	143,754	2,326½	266,373½
Year ended 5th January 1846,	411,271	121,375	532,646	142,473½	127,027½	113,678	2,488½	243,194
Year ended 5th January 1847,	414,915¼	192,535¾	607,451	156,278½	102,585	148,363½	4,765½	255,714
Year ended 5th January 1848,	372,989½	189,754	562,743½	146,500½	102,690	142,532	4,959	250,181
Year ended 5th January 1849,	392,827	251,541¼	644,368¼	153,944	78,262½	168,049	3,682½	249,994
Year ended 5th January 1850,	507,024½	263,673¾	770,698¼	213,286½	78,889¾	257,108	4,258½	340,256¼

ABSTRACT showing the Total Quantity of WHITE HERRINGS Cured, Branded, and Exported, year by year, etc.—

PERIODS.	Total Quantity of Herrings Cured.			Total Quantity of Herrings Branded.	Total Quantity of Herrings Exported.			Grand Total Exported.
	Gutted.	Ungutted includ. Bulk.	Total Cured.		To Ireland.	To the Continent.	To places out of Europe.	
	Barrels.	*Barrels.*	*Bls. or Crans.*	*Barrels,*	*Bls. or Crans.*	*Barrels.*	*Barrels.*	*Barrels.*
*Year ended 5th January 1851, for Scotland and the Isle of Man only	378,187	165,822½	544,009½	172,924½	66,138	198,403	2,367	266,908
Year ended 5th January 1852, for do. do.	417,233¼	176,797¾	594,031	201,636½	81,340½	182,659	205	264,204½
Year ended 31st December 1852, for do. do.	375,693	123,094½	498,787½	169,159½	60,414	221,979	1,133	283,526
Year ended 31st December 1853, for do. do.	560,367	217,672¾	778,039¾	248,136½	95,339	242,853¼	4,438½	342,630¾
Year ended 31st December 1854, for do. do.	458,579½	177,982¾	636,562¼	211,844	121,883¾	237,893½	1,919½	361,696¾
Year ended 31st December 1855, for do. do.	582,715¼	183,988¼	766,703½	280,581½	97,377	344,029	858	442,264
Year ended 31st December 1856, for do. do.	466,429½	143,559	609,988½	223,281	89,670¾	256,741	1,199½	347,611¼
Year ended 31st December 1857, for do. do.	465,292½	115,521¼	580,813¾	218,992	58,534	307,275½	1,351	367,160½
Year ended 31st December 1858, for do. do.	470,393¼	165,730¼	636,124	233,374	79,054	269,819	1,331½	350,204½
†Year ended 31st December 1859, for do. do.	381,059¼	110,428	491,487¼	158,676	68,882	203,349½	748	272,979½
Year ended 31st December 1860, for do. do.	496,414½	184,778¾	681,193¼	231,913½	86,413	291,401½	156	377,970½
Year ended 31st December 1861, for do. do.	519,173	149,655½	668,828½	265,347	81,595½	308,334¼	384	390,313¾
Year ended 31st December 1862, for do. do.	656,048	174,856	830,904	346,712	70,879¾	423,182¾	847½	494,910
Year ended 31st December 1863, for do. do.	507,223	147,593½	654,816½	276,880½	72,074½	333,074¼	2,612¾	407,761½
Year ended 31st December 1864, for do. do.	478,781½	164,868¾	643,650¼	217,392	55,420½	307,282	1,805	364,507½
Year ended 31st December 1865, for do. do.	470,559½	151,203½	621,763	216,785	42,063	309,626	1,012	352,701
Year ended 31st December 1866, for do. do.	497,814½	160,332¼	658,146¾	249,510	47,319	328,272½	4,474½	380,066
Year ended 31st December 1867, for do. do.	631,759½	193,829½	825,589	317,421	42,364¼	432,994½	3,345½	478,704¼
Year ended 31st December 1868, for do. do.	445,468½	205,965¼	651,433¾	209,462½	43,414½	323,479¾	1,850½	368,744¾
*Year ended 31st December 1869, for Scotland only	488,831	186,312	675,143	244,522½	32,342½	346,793¾	2,197½	381,333¾
Year ended 31st December 1870, for do.	657,059½	176,101	833,160½	299,381½	41,524	486,064	2,970	530,558
Year ended 31st December 1871, for do.	668,489½	156,986¼	825,475¾	346,633½	46,347	502,534¼	2,724	551,605¼
Year ended 31st December 1872, for do.	671,703½	102,156	773,859½	422,731½	24,147	523,540½	1,943½	549,631
Year ended 31st December 1873, for do.	796,902	142,331½	939,233½	435,274½	32,465½	633,681	1,861½	668,008
Year ended 31st December 1874, for do.	887,002½	113,558½	1,000,561	517,558½	28,137¼	706,967¾	2,209¾	737,314¾
Year ended 31st December 1875, for do.	834,822½	108,157½	942,980	523,789½	33,434	624,137½	3,399	660,970½
Year ended 31st December 1876, for do.	486,238½	111,959	598,197½	252,979½	20,333	378,740	1,350½	400,423½
Year ended 31st December 1877, for do.	716,871¼	130,847½	847,718¾	397,795	16,085½	543,908¼	1,992	561,985¾
Year ended 31st December 1878, for do.	771,556	134,212	905,768	456,708	17,445¾	608,969¼	2,519	628,934

N.B.—In the Six Years ending 5th April 1815, the Bounty on Herrings Cured Gutted was 2s. per Barrel, while there was a Bounty at the same time of 2s. 8d. per Barrel, payable by the Excise on the Exportation of Herrings, whether Cured Gutted or Ungutted, but which ceased on the 1st June 1815; in the Eleven Years ending 5th April 1826, the Bounty on Herrings Cured Gutted was 4s per Barrel; in the Four succeeding Years, the Bounty was reduced 1s. per Barrel each Year till the 5th of April 1830, when it ceased altogether, and has not since been renewed.

* The Collection of Returns for England ceased from the 5th of January 1850; and for the Isle of Man from the 1st of January 1869.

† By Act 21st and 22d Vict. cap. 69 (1858), there was imposed upon the Branding of Barrels and Half-Barrels of Herrings a Fee of *Fourpence* per Barrel and *Twopence* per Half-Barrel.

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

COD AND LING FISHERY ACCOUNTS.

No. I.

ACCOUNT, by Districts, of the Number of Vessels fitted out in SCOTLAND for the COD and LING Fishery, in the Year ended 31st December 1878; of the Tonnage of the Vessels, and the Number of Men; also of the quantity of COD, LING, and HAKE Cured therefrom, distinguishing whether Cured Dried or Cured in Pickle.

DISTRICTS.	Vessels.	Tonnage.	Men.	Total Quantity of Cod, Ling, and Hake Cured in Vessels.		
				Number of Fish.	Cured Dried.	Cured in Pickle.
	Number	*Tons.*	*Number*	*Number.*	*Cwts.*	*Barrels.*
Anstruther,	1	54	10	1,700	63	...
Peterhead,	3	337	47	22,022	741	...
Fraserburgh,	17	261	107	70,835	2,894	...
Orkney Isles,	38	2,139	413	653,937	17,283	...
Shetland Isles,	73	3,496	897	1,807,448	34,146	...
Inverary,	1	15	7	4,200	130	...
Total,	133	6,302	1,481	2,560,142	55,257	...

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

No. II.

ACCOUNT, by Districts, of the COD, LING, and HAKE taken at the Cod and Ling Fishery in SCOTLAND by Open Boats and Cured on Shore, in the Year ended 31st December 1878; distinguishing the Fish Cured Dried and the Fish Cured in Pickle.

DISTRICTS.	Total Quantity of Cod, Ling, and Hake Cured on Shore.		
	Number of Fish.	Cured Dried.	Cured in Pickle.
	Number.	*Cwts.*	*Barrels.*
Leith,	1,800	60	...
Anstruther,	130,375	4,103	62
Montrose,	93,034	2,925	11
Aberdeen,	51,800	1,721	42
Peterhead,	65,619	977	1,234
Fraserburgh,	192,639	6,755	72
Banff,	148,576	5,180	656
Buckie,	103,701	2,044	2,369
Findhorn,	45,643	834	968
Cromarty,	7,493	...	231
Helmsdale,	18,282	100	215
Lybster,	4,953	22	177
Wick,	85,971	780	2,894
Orkney Isles,	326,663	10,646	38
Shetland Isles,	1,554,008	58,324	...
Stornoway,	623,567	26,017¾	...
Loch Broom,	70,388	2,741	27
Loch Carron and Skye,	20,820	767	...
Fort William,	64,660	2,418	...
Campbeltown,	40,626	2,100½	...
Inverary,	1,140	37	3
Ballantrae,	6,825	...	220
Total,	3,658,583	128,552¼	9,219

Fishery Board: Scotland:
Edinburgh, 1st June, 1879.

B. F. PRIMROSE, *Secretary.*

COD AND LING FISHERY ACCOUNTS.

No. III.

ACCOUNT, by Districts, of the Total Quantity of Cod, Ling, and Hake taken, both by Vessels and by Open Boats, at the Cod and Ling Fishery in Scotland, and Cured, in the Year ended 31st December 1878; distinguishing the Fish Cured Dried and the Fish Cured in Pickle.

DISTRICTS.	Total Quantity of Cod, Ling, and Hake Cured.		
	Number of Fish.	Cured Dried.	Cured in Pickle.
	Number.	*Cwts.*	*Barrels.*
Leith,	1,800	60	...
Anstruther,	132,075	4,166	62
Montrose,	93,034	2,925	11
Aberdeen,	51,800	1,721	42
Peterhead,	87,641	1,718	1,234
Fraserburgh,	263,474	9,649	72
Banff,	148,576	5,180	656
Buckie,	103,701	2,044	2,369
Findhorn,	45,643	834	968
Cromarty,	7,493	...	231
Helmsdale,	18,282	100	215
Lybster,	4,953	22	177
Wick,	85,971	780	2,894
Orkney Isles,	980,600	27,929	38
Shetland Isles,	3,361,456	92,470	...
Stornoway,	623,567	26,017¾	...
Loch Broom,	70,388	2,741	27
Loch Carron and Skye,	20,820	767	...
Fort William,	64,660	2,418	...
Campbeltown,	40,626	2,100½	...
Inverary,	5,340	167	3
Ballantrae,	6,825	...	220
Total,	6,218,725	183,809¼	9,219

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

No. IV.

ACCOUNT of the Total Quantity of Cod, Ling, and Hake Exported from Scotland, in the Year ended 31st December 1878, with the Districts from which Exported; distinguishing the Export to Ireland, to the Continent, and to places out of Europe; also whether Cured Dried or Cured in Pickle.

DISTRICTS.	COD, LING, AND HAKE EXPORTED.			
	To Ireland.	To the Continent.	To places out of Europe.	Total Exported.
	Cured Dried.	Cured Dried.	Cured Dried.	Cured Dried.
	Cwts.	*Cwts.*	*Cwts.*	*Cwts.*
Leith,	11,520	11,100	876	23,496
Aberdeen,	...	...	5,808	5,808
Wick,	228	...	...	228
Orkney Isles,	2,686	...	...	2,686
Shetland Isles,	23,140	27,160	...	50,300
Stornoway,	1,180	2,000	...	3,180
Campbeltown,	1,464	...	...	1,464
Greenock,	2,690½	20	5,097	7,807½
Total,	42,908½	40,280	11,781	94,969½

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

ABSTRACT, showing the Total Quantity of Cod, Ling, and Hake Cured, Punched, or Branded, and Exported, year by year, *in so far as brought under cognizance of Fishery Officers*, from the 10th of October 1820, when the System for Encouragement and Improvement of the Cod and Ling Fishery commenced, to the 31st of December 1878.

PERIODS.	Total Quantity of Cod, Ling, and Hake Cured.			Total Quantity of Cod, Ling, and Hake Punched or Branded.		Total Quantity of Cod, Ling, and Hake Exported.	
	Cured Dried.	Cured in Pickle.		Cured Dried.	Cured in Pickle.	Cured Dried.	Cured in Pickle.
	Cwts.	*Cwts.*	*Barrels.*	*Cwts.*	*Barrels.*	*Cwts. qrs. lbs.*	*Barrels.*
Period extending from 10th Oct. 1820 to 5th April 1822,	...	...	...	50,235¼	4,919½	19,578 3 „	...
Year ended 5th April 1823,	...	...	...	54,573	3,691	19,398 3 „	...
Year ended 5th April 1824,	...	...	...	63,590	5,437	23,098 „ 3	...
Year ended 5th April 1825,	...	...	...	52,135	3,531	14,087 2 19	...
Year ended 5th April 1826,	69,136½	3,634¾	5,621	66,315¾	5,337	7,281 1 14	...
Year ended 5th April 1827,	95,161½	9,273	9,025	82,185¾	8,008½	14,051 2 27	...
Year ended 5th April 1828,	82,515¼	6,726	6,142½	74,103¾	5,609½	13,208 2 „	...
Year ended 5th April 1829,	81,321¼	5,786	6,819	73,500½	6,204	20,587 3 4	...
Year ended 5th April 1830,	101,914	5,652½	8,836½	92,314½	8,464	16,369 3 15	...
Year ended 5th April 1831,	37,674	...	2,950½	34,337½	2,459½	11,920 1 1	...
Year ended 5th April 1832,	50,293	...	3,779½	13,879¾	3,230	20,168 3 16	47
Year ended 5th April 1833,	58,461½	...	6,467½	13,581¼	4,393½	14,754 1 26	67
Year ended 5th April 1834,	52,710½	...	5,522½	14,255½	3,829	16,298 3 „	24
Year ended 5th April 1835,	44,152¾	...	3,767½	9,492¼	2,235	10,632 2 24	...
Year ended 5th April 1836,	38,040	...	6,276	6,766	3,018	10,992 2 20	...
Year ended 5th April 1837,	66,892½	...	7,273	9,589½	3,206	10,195 2 11	1½
Year ended 5th April 1838,	84,996¾	...	10,303	9,259½	4,373	22,166 2 12	36
Year ended 5th April 1839,	85,279¾	...	10,051½	23,936¼	5,093	26,701 3 „	150
Year ended 5th April 1840,	93,560¾	...	6,053	21,695½	3,205	29,656 1 „	24
Year ended 5th April 1841,	91,494¾	...	9,480	21,029¼	3,891	30,550 1 „	44
Year ended 5th April 1842,	76,849	...	7,038½	13,283¾	2,164	25,293 1 „	...
Year ended 5th April 1843,	77,207¼	...	6,431	10,030¼	1,342	23,737 3 „	70
Year ended 5th April 1844,	92,813½	...	5,123	20,810¼	2,226½	35,476 „ „	4
Period extending from 5th April 1844 to 5th January 1845,	83,919	...	1,726	17,940¼	229	28,815 „ „	20
Year ended 5th January 1846,	92,323	...	5,037	14,372½	935	29,352 „ „	...
Year ended 5th January 1847,	90,783¾	...	6,341½	12,387½	1,492	34,435 1 „	15
Year ended 5th January 1848,	86,624¼	...	6,247½	8,145¼	955	25,662 3 „	...
Year ended 5th January 1849,	85,463	...	6,810½	9,520	1,681	22,608 3 „	...
Year ended 5th January 1850,	98,903	...	6,588	15,556	997	24,154 1 „	20
*Year ended 5th January 1851, for Scotland and the Isle of Man only,	90,658¾	...	5,032	† ...	...	22,304 1 „	...

* The Collection of Returns for England ceased from the 5th of January 1850.
† The Punching and Branding of Cod and Ling ceased from the 5th of January 1850.

ABSTRACT, showing the Total Quantity of Cod, Ling, and Hake Cured, Punched or Branded, and Exported year by year, etc.—*continued.*

PERIODS.	Total Quantity of Cod, Ling, and Hake Cured.			Total Quantity of Cod, Ling, and Hake Punched or Branded.		Total Quantity of Cod, Ling, and Hake Exported.			
	Cured Dried.	Cured in Pickle.*		Cured Dried.	Cured in Pickle.	Cured Dried.			Cured in Pickle.
	Cwts.	*Cwts.*	*Barrels.*	*Cwts.*	*Barrels.*	*Cwts.*	*qrs.*	*lbs.*	*Barrels.*
Year ended 5th January 1852, for Scotland and the Isle of Man only, ...	92,083¼	...	7,019¾	...	...	17,141	2	„	...
Year ended 31st Decr. 1852, for do. do.	102,976¼	...	6,886	...	...	18,994	2	„	...
Year ended 31st Decr. 1853, for do. do.	105,596	...	5,122½	...	...	22,650	3	„	14
Year ended 31st Decr. 1854, for do. do.	109,684¼	...	6,166½	...	...	19,557	2	„	...
Year ended 31st Decr. 1855, for do. do.	113,561¼	...	6,316½	...	...	29,154	2	„	25
Year ended 31st Decr. 1856, for do. do.	110,504¾	...	6,642	...	...	29,629	3	„	...
Year ended 31st Decr. 1857, for do. do.	104,668½	...	4,393½	...	...	34,310	„	„	...
Year ended 31st Decr. 1858, for do. do.	95,596	...	4,584	...	...	32,152	„	„	...
Year ended 31st Decr. 1859, for do. do.	118,383	...	5,362½	...	...	35,923	„	„	...
Year ended 31st Decr. 1860, for do. do.	115,688	...	4,339½	...	...	32,221	„	„	...
Year ended 31st Decr. 1861, for do. do.	82,344¾	...	4,145½	...	...	26,961	„	„	...
Year ended 31st Decr. 1862, for do. do.	100,657½	...	7,735½	...	...	32,969	3	„	...
Year ended 31st Decr. 1863, for do. do.	129,725¾	...	7,337	...	...	53,736	„	„	...
Year ended 31st Decr. 1864, for do. do.	107,758¼	...	7,963½	...	...	46,461	„	„	...
Year ended 31st Decr. 1865, for do. do.	112,807	...	7,678	...	...	44,928	3	„	...
Year ended 31st Decr. 1866, for do. do.	115,819	...	9,957½	...	...	47,753	„	„	15
Year ended 31st Decr. 1867, for do. do.	119,638¼	...	10,819	...	...	46,225	„	„	...
Year ended 31st Decr. 1868, for do. do.	113,831	...	9,659	...	...	52,403	„	„	...
*Year ended 31st Decr. 1869, for Scotland only	135,585¼	...	10,319	...	...	51,864	2	„	...
Year ended 31st Decr. 1870, for do.	145,288¾	...	9,945	...	...	56,400	2	„	...
Year ended 31st Decr. 1871, for do.	119,030	...	9,283	...	...	54,171	1	„	...
Year ended 31st Decr. 1872, for do.	145,976½	...	11,940½	...	...	53,631	„	„	...
Year ended 31st Decr. 1873, for do.	160,716½	...	12,381½	...	...	70,101	2	„	...
Year ended 31st Decr. 1874, for do.	143,466¼	...	6,754	...	...	60,913	„	„	...
Year ended 31st Decr. 1875, for do.	187,788½	...	8,503½	...	...	81,880	2	„	...
Year ended 31st Decr. 1876, for do.	111,457	...	6,109	...	...	59,866	„	„	...
Year ended 31st Decr. 1877, for do.	187,200½	...	8,619½	...	...	73,368	2	„	...
Year ending 31st Decr. 1878, for do.	183,809¼	...	9,219	...	...	94,969	2	„	...

N.B.—The Books of this department do not exhibit the Total Quantity of Cod, Ling, and Hake *Cured* till the Year commencing 5th April 1825. The Bounty, from the commencement of this Abstract to the 5th of April 1830, was 4s. per cwt. for Fish cured Dried, and 2s. 6d. per Barrel for Fish cured in Pickle, taken by the Crews of Vessels or Boats *not* on the Tonnage Bounty; while the Bounty for Vessels licensed for the Cod and Ling Fishery, on the *Tonnage* Bounty, was 50s. per Ton, for Tonnage and Cargo to the 5th of July 1826; 45s. from thence to the 5th of July 1827; 40s. to the 5th of July 1828; and 35s. to the 5th of April 1830, when the Bounties ceased altogether, and have not since been renewed.

* The collection of Returns for the Isle of Man ceased from the 1st of January 1869.

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

FISHERY STATISTICS.

No. I.

FISHERY STATISTICS.—ACCOUNT of the Number of Boats, whether Decked or Undecked, *irrespective* of the places to which they belong, employed in the Herring Fishery: SCOTLAND: in the Season of 1878, in a selected Week for each District; with the Number of Fishermen and Boys by whom manned; of Coopers, Gutters, Packers, and Labourers employed at the said Fishery in the Week so selected; and the Total Number of all such Fishermen and other Persons so employed.

Districts where the Boats were employed at the Herring Fishery.	Boats.	Fishermen and Boys.	Coopers.	Gutters and Packers.	Labourers.	Total Persons employed.
	Number.	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*
Eyemouth,	321	1,842	139	923	213	3,117
Leith,	70	280	30	120	40	470
Anstruther,	215	1,262	80	320	105	1,765
Montrose,	233	1,332	109	715	73	2,229
Aberdeen,	490	3,048	194	1,655	164	5,061
Peterhead,	683	4,098	294	2,092	240	6,724
Fraserburgh,	879	5,281	369	2,664	295	8,609
Banff,	107	626	46	416	36	1,124
Buckie,	32	186	12	98	11	307
Findhorn,	47	282	14	130	11	437
Cromarty,	29	145	6	70	14	235
Helmsdale,	199	1,194	56	537	36	1,823
Lybster,	161	955	47	384	63	1,449
Wick,	579	3,474	225	1,795	169	5,663
Orkney Isles,	192	1,628	50	490	17	2,185
Shetland Isles,	117	610	34	324	7	975
Stornoway,	871	4,554	219	2,276	78	7,127
Loch Broom,	90	450	4	250	3	707
Loch Carron and Skye,	370	1,110	18	156	7	1,291
Fort William,	118	354	9	218	6	587
Campbeltown,	299	897	4	6	...	907
Inverary,	188	596	6	104	19	725
Rothesay,	115	345	...	...	10	355
Greenock,	28	96	...	...	12	108
Ballantrae,	191	764	22	20	143	949

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

No. II.

FISHERY STATISTICS.—ACCOUNT of the Number and Tonnage of Boats, Decked or Undecked, employed in the Shore Curing Herring, and Cod and Ling Fisheries: SCOTLAND: in the Year ended 31st December 1878, with the Districts to which they belong; the Number of Fishermen and Boys by whom manned; the Number of Fish-curers, Coopers, and other Persons employed; with the estimated value of Boats, Nets, and Lines.

DISTRICTS.	FISHING BOATS.								Fishermen and Boys.	Fish Curers.	Coopers.	Other Persons (*Estimated.*)	Total Persons Employed.	VALUE (*Estimated*) OF—			
	First Class. 30 feet Keel and upwards.		Second Class. From 18 to 30 feet Keel.		Third Class. Under 18 feet Keel.		Total.							Boats.	Nets.	Lines.	Total.
	Number.	*Tons.*	*Number.*	*Tons.*	*Number.*	*Tons.*	*Number.*	*Tons.*	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*				
Eyemouth,	318	5,677	152	861	89	277	559	6,815	1,714	50	140	2,464	4,368	£43,012	£34,060	£6,292	£83,364
Leith,	162	3,222	322	1,610	27	54	511	4,886	1,408	19	72	945	2,444	22,722	29,180	4,133	56,035
Anstruther,	520	7,914½	149	565	94	178½	763	8,658	3,132	44	80	2,207	5,463	43,525	65,349	15,252	124,126
Montrose,	173	3,244	250	1,108	261	516	684	4,868	1,218	41	109	1,795	3,163	26,389	22,770	7,249	56,408
Aberdeen,	148	2,220	162	810	64	128	374	3,158	1,006	53	194	3,970	5,223	15,816	14,170	4,275	34,261
Peterhead,	316	5,372	201	1,206	130	390	647	6,968	2,643	70	296	3,227	6,236	38,670	47,400	6,830	92,900
Fraserburgh,	327	5,232	86	516	265	795	678	6,543	1,944	72	369	3,771	6,156	40,240	49,377	5,400	95,017
Banff,	283	3,396	99	594	93	279	475	4,269	1,375	39	46	796	2,256	16,082	22,640	4,740	43,462
Buckie,	640	9,595	56	280	198	594	894	10,469	3,750	22	37	2,619	6,428	62,694	64,000	15,642	142,336
Findhorn,	321	4,261	110	537	33	88	464	4,886	1,892	51	50	2,626	4,619	21,861	36,490	5,261	63,612
Cromarty,	131	1,739	130	628	31	64	292	2,431	912	8	14	557	1,491	6,811	16,612	2,037	25,460
Helmsdale,	117	1,492	57	263	29	62	203	1,817	706	23	60	681	1,470	5,080	12,216	1,305	18,601
Lybster,	212	3,114	14	88	29	29	255	3,231	1,201	19	47	451	1,718	11,870	15,734	554	28,158
Wick,	438	6,867	56	366	314	628	808	7,861	2,748	81	236	3,773	6,838	41,787	36,261	3,310	81,358
Orkney Isles,	225	3,048	25	182	395	875	645	4,105	2,618	31	50	862	3,561	13,179	12,162	1,580	26,921
Shetland Isles,	13	142	341	682	256	256	610	1,080	2,795	37	26	1,138	3,996	5,733	2,172	4,732	12,637
Stornoway,	182	2,730	401	2,809	441	1,323	1,024	6,862	3,934	35	53	3,457	7,479	20,763	20,195	11,266	52,224
Loch Broom,	74	1,042	68	554	548	2,192	690	3,788	2,750	18	8	1,048	3,824	7,400	16,290	2,338	26,028
Loch Carron and Skye,	23	348	151	824	470	918	644	2,090	1,996	34	17	1,007	3,054	5,975	14,968	2,094	23,037
Fort William	31	330	138	579	454	958	623	1,867	1,371	30	9	546	1,956	4,794	4,964	1,232	10,990
Campbeltown,	85	1,420	298	1,236	174	348	557	3,004	1,526	38	4	401	1,969	21,108	13,952	758	35,818
Inverary,	25	456	481	2,423	244	488	750	3,367	1,738	41	6	282	2,067	15,101	21,771	1,496	38,368
Rothesay,	22	330	241	1,123	179	358	442	1,811	677	19	4	285	985	10,223	8,949	413	19,585
Greenock,	11	161	177	753	95	117	283	1,031	549	28	32	900	1,509	4,525	5,055	565	10,145
Ballantrae,	12	159	223	733	321	369	556	1,261	926	73	25	729	1,753	5,803	4,395	1,065	11,263
Total,	4,809	73,511½	4,388	21,330	5,234	12,284½	14,431	107,126	46,529	976	1,984	40,537	90,026	£511,163	£591,132	£109,819	£1,212,114

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

No. III.

FISHERY STATISTICS.—ACCOUNT of the Tonnage of Shipping and of the Number of Seamen engaged in the Trade of the Herring and Cod and Ling Fisheries: SCOTLAND: in the Year ended 31st December 1878; distinguishing those employed in Importing Stave Wood, Hoops, and Salt, in carrying Herrings or Cod Fish Coastwise, or Exporting them abroad, and distinguishing British from Foreign Tonnage and Men.

DISTRICTS.	TONNAGE AND MEN.																TOTAL.			
	Importing Stave Wood and Hoops for the Fisheries.				Importing Salt for the Fisheries.				Carrying Herrings or Cod-Fish Coastwise.				Exporting Herrings or Cod-Fish.							
	British.		Foreign.		British.		Foreign.		British.		Foreign.		British.		Foreign.		British.		Foreign.	
	T°ns.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.
Eyemouth,	249	15	...	...	1,442	71	...	...	536	36	...	...	...	...	...	...	2,227	122	...	...
Leith,	300	25	150	12	500	35	200	15	500	30	100	6	3,320	315	200	10	4,620	405	650	43
Anstruther,	352	17	183	14	466	26	...	...	465	23	...	...	99	5	74	4	1,382	71	257	18
Montrose,	274	15	209	12	1,857	107	...	...	103	7	...	...	923	54	233	14	3,157	183	442	26
Aberdeen,	2,283	138	125	9	2,514	150	...	...	880	53	...	...	4,332	277	2,792	151	10,009	618	2,917	160
Peterhead,	1,937	108	1,299	94	3,457	202	514	24	240	20	...	...	11,201	656	2,285	114	16,835	986	4,098	232
Fraserburgh,	2,605	140	2,075	139	6,027	358	...	...	366	46	...	...	15,830	946	5,802	327	24,828	1,490	7,877	466
Banff,	...	...	50	4	620	36	90	6	150	12	...	...	1,253	77	186	11	2,023	125	326	21
Buckie,	...	...	...	...	213	16	...	...	...	...	...	...	102	7	...	...	315	23	...	...
Findhorn	...	...	...	...	139	8	...	...	...	...	...	...	...	...	...	...	139	8	...	...
Cromarty,	75	12	...	...	150	12	...	...	103	9	...	...	41	2	...	...	369	35	...	...
Helmsdale,	162	10	124	9	853	54	...	...	73	7	...	...	904	52	180	9	1,992	123	304	18
Lybster,	90	5	92	9	278	22	...	...	50	3	...	...	712	46	63	4	1,130	76	155	13
Wick,	2,044	117	2,077	148	2,635	181	...	...	1,338	121	...	...	6,140	351	1,430	80	12,157	770	3,507	228
Orkney Isles,	...	...	...	...	1,545	113	...	...	1,080	81	...	...	2,050	131	...	...	4,675	325	...	...
Shetland Isles,	...	...	...	...	1,667	110	...	...	2,304	139	...	...	2,207	148	1,029	70	6,178	397	1,029	70
Stornoway,	195	12	74	4	2,452	168	...	...	6,369	563	...	...	3,123	232	100	7	12,139	975	174	11
Loch Broom,	...	...	...	...	270	16	...	...	404	27	...	...	...	...	...	...	674	43	...	...
Loch Carron & Skye,	...	...	...	...	991	43	...	...	1,063	89	...	...	...	...	...	...	2,054	132	...	...
Fort William,	...	...	...	...	576	37	...	...	1,400	64	...	...	...	...	...	...	1,976	101	...	...
Campbeltown,	...	...	...	...	234	16	...	...	1,720	48	...	...	48	4	...	...	2,002	68	...	...
Inverary,	...	...	...	...	70	4	...	...	1,010	53	...	...	7	2	...	...	1,087	59	...	...
Rothesay,	...	...	...	...	40	3	...	...	354	33	...	...	...	...	...	...	394	36	...	...
Greenock,	80	5	...	...	900	44	...	...	880	37	...	...	846	45	...	...	2,706	131	...	...
Ballantrae,	...	...	...	...	115	11	...	...	80	8	...	...	...	...	...	...	195	19	...	...
Total,	10,646	619	6,458	454	30,011	1,843	804	45	21,468	1,509	100	6	53,138	3,350	14,374	801	115,263	7,321	21,736	1,306

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

No. IV.

FISHERY STATISTICS.—ABSTRACT ACCOUNTS showing the Tonnage of Vessels and Number of Men, the Tonnage of Boats and Number of Fishermen and Boys, and the Number of other Persons employed in the Herring and Cod and Ling Fisheries: SCOTLAND: in the Year ended 31st December 1878.

ABSTRACT.	Tonnage of Vessels and Number of Men.				Tonnage of Boats, and Number of Fishermen and Boys.		Number of other Persons.	Total Tonnage and Persons Employed.			
	British.		Foreign.					British.		Foreign.	
	Tons.	Men.	Tons.	Men.	Tons.	Fishermen and Boys.		Tons.	Persons.	Tons.	Persons.
Total of Herring Fishery Account, No. 1, .	2,354	521	...	...	...	...	...	2,354	521	...	...
Do. of Cod and Ling Fishery Account, No. 1,	6,302	1,481	...	...	...	...	...	6,302	1,481	...	...
Do. of Fishery Statistics Account, No. 2, .	...	...	...	...	107,126	46,529	43,497	107,126	90,026	...	...
Do. do. No. 3, .	115,263	7,321	21,736	1,306	...	...	...	115,263	7,321	21,736	1,306
Total,	123,919	9,323	21,736	1,306	107,126	46,529	43,497	231,045	99,349	21,736	1,306

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

Report by the Engineers upon the Harbour Works in progress under the Fishery Board: Scotland: Year 1878.

The only works undertaken by the Board during last season were those at Burnmouth. The contract works have been finished; but some additional excavations in the interior of the harbour, and the repair of the old pier-head, have not yet been finished, owing to the state of the weather.

(Signed) D. & T. STEVENSON.

Edinburgh, 23*d January* 1879.

HARBOUR ACCOUNTS.

GENERAL ACCOUNT, PIERS OR QUAYS.

An ACCOUNT of the SUMS RECEIVED and PAID by the COMMISSIONERS of the FISHERY BOARD: SCOTLAND: for BUILDING or REPAIRING PIERS or QUAYS: under the Act 5th George IV. cap. 64. Year ended 31st December 1878.

1878.	*Dr.*				1878.	*Cr.*			
	To Balance at 31st December 1877,	£5,571	9	5	December 31.	By Payments for the Works, &c., at Burnmouth Harbour, on account,	£5,268	8	10
	Less paid subsequently for Anstruther Harbour, as entered in last year's account,	4	0	0	„ „	„ Do. to Engineers, their Engineering Fees on do.,	200	0	0
				£5,567 9 5	„ „	„ Do. to Harbour Inspector, his wages on do.,	141	0	3
June 23.	„ Annual Parliamentary Grant for year ending 31st March 1879,			3,000 0 0					
July 31.	„ Bank Interest upon this Account, year ended 31st March 1878,			27 16 2		Balance,	2,985	16	6
				£8,595 5 7			£8,595	5	7

B. F. PRIMROSE, *Secretary.*

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

ABSTRACT showing the EXPENDITURE upon the HARBOUR WORKS carrying on by the COMMISSIONERS of the FISHERY BOARD: SCOTLAND: Year ended 31st December 1878.

Dr.

BURNMOUTH HARBOUR, COUNTY OF BERWICK.

1878.		
To Balance brought forward from Abstract of 31st December 1877, ...	£6,836	10 3
	£6,836	10 3

Cr.

FISHERMEN OF BURNMOUTH.

1878.				
December 31. By Payments during the year ended this date, viz.—				
For Works of Improvement on Burnmouth Harbour, on account, .	£5,268	8	10	
„ Engineers' Fees, on do., . .	200	0	0	
„ Inspector's Wages, on do., .	141	0	3	
				5,609 9 1
By Balance carried forward in continuation of the Works, ...				1,227 1 2
				£6,836 10 3

Fishery Board: Scotland:
Edinburgh, 1st June 1879.

B. F. PRIMROSE, *Secretary.*

REPORT

BY THE

COMMISSIONERS OF THE FISHERY BOARD: SCOTLAND:

OF THEIR PROCEEDINGS:

YEAR ENDED 31ST DECEMBER 1878,

BEING FISHING 1878.

Edinburgh: Printed by NEILL AND COMPANY,
For Her Majesty's Stationery Office,
1879.